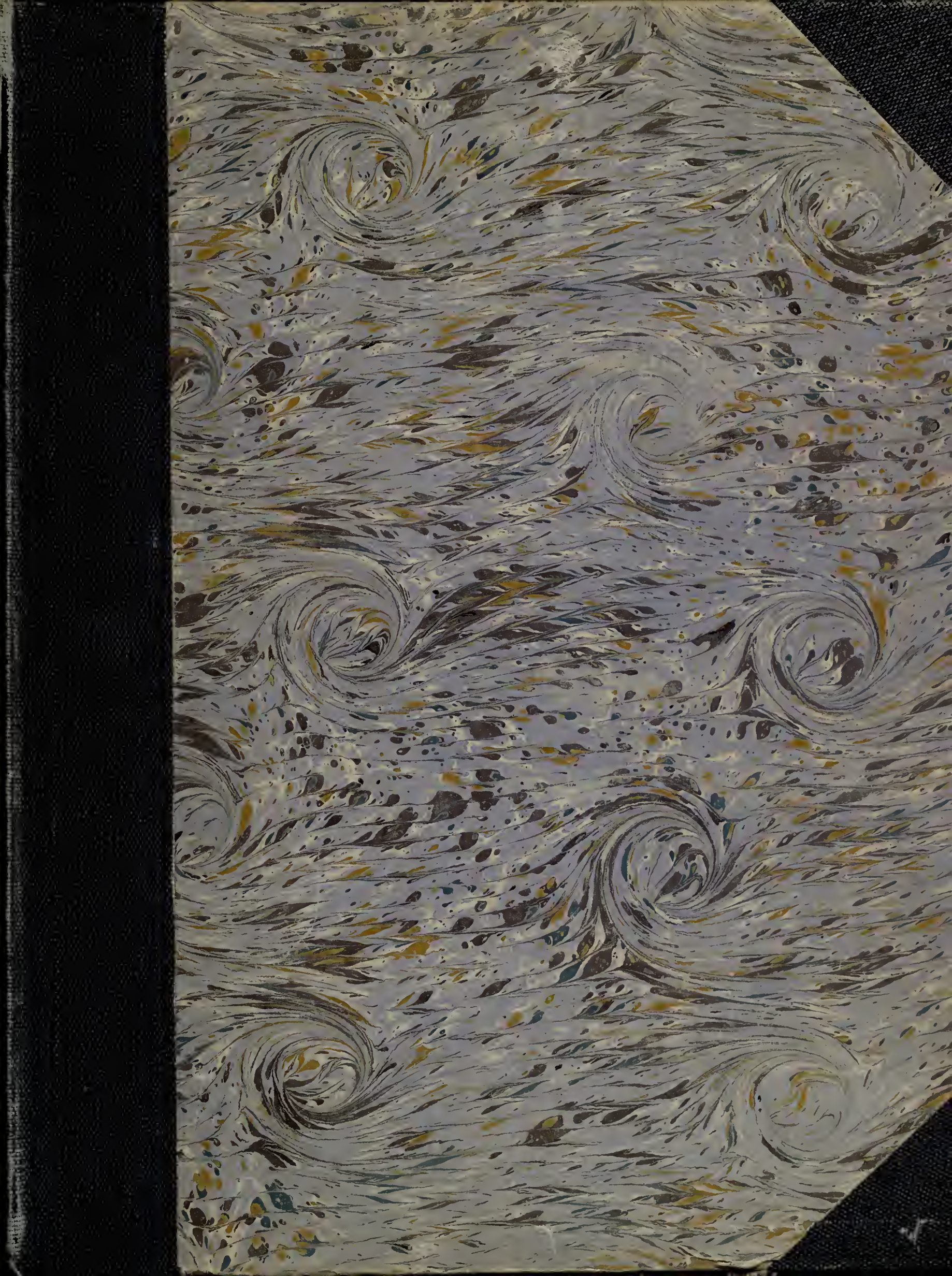




LIBRARY
UNIVERSITY OF CALIFORNIA
DAVIS



Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

B I O L O G I A
CENTRALI-AMERICANA.

I N S E C T A.

LEPIDOPTERA-RHOPALOCERA..

VOL. I.

(*TEXT.*)

BY

FREDERICK DUCANE GODMAN, D.C.L., F.R.S., &c.,

AND

OSBERT SALVIN, M.A., F.R.S., &c.

1879-1901.

LIBRARY

CONTENTS OF VOL. I.

	Page
INTRODUCTION	v
LIST OF PLATES	xxxi
ERRATA ET CORRIGENDA	xlvi
NYMPHALIDÆ	1
DANAINÆ	1
Danaina	1
Ithomiina	6
SATYRINÆ	62
MORPHINÆ	113
BRASSOLINÆ	122
ACRÆINÆ	140
HELICONIINÆ	143
NYMPHALINÆ	166
LIBYTHEIDÆ	359
ERYCINIDÆ	361
NEMEOBIINÆ	362
ERYCININÆ	374

INTRODUCTION.

THE completion of the Volumes dealing with the very rich Rhopalocerous fauna of Mexico and Central America has been inordinately delayed from various causes—the constant pressure of other work, the ever-increasing amount of material, the gradually failing health and subsequent death of my colleague, Osbert Salvin, and the great difficulty of dealing with the Hesperiidæ. Salvin, however, lived long enough to help me conclude all but the Pamphilinæ and the latter part of the Supplement. The difficulty with the Hesperiidæ was, in a measure, solved, in 1893, by the publication of Watson's classification of that family, and our arrangement of the Pyrrhopyginæ and Hesperiinæ is mainly based on that author's system; the Pamphilinæ, however, were left unfinished, and but little use could be made of his work on these insects. Moreover, on commencing our study of the Hesperiidæ we found it necessary to dissect and examine the genitalia of the males of various critical species; and this led us to continue the process to the whole of them, a work requiring much time, but amply repaid by the results, as may be seen by a reference to our Plates. As an instance of the importance of these characters, we may note that in *Thanaos* several of the species are absolutely inseparable by external peculiarities, but markedly different in their genital structure.

Our study of the Central-American butterflies proves conclusively (1) that the fauna is mainly a northern extension of that of Tropical South America, extending on the Pacific side to Mazatlan and on the Atlantic to a little beyond Ciudad Victoria in Tamaulipas, some few species on each coast reaching the Southern United States, with, of course, many peculiarly modified forms in the region; (2) that there are a considerable number of Nearctic genera and species coming down the central plateau a certain distance into Mexico and some even into Guatemala, as *Argynnis*, *Vanessa*, *Limenitis*, *Grapta*, various *Colias*, &c.; (3) that there are no strictly alpine forms, the insects met with above the tree-line being mostly stragglers from below, such species

as occur at the highest limits of the forest being very like those of similar Andean localities, these mostly belonging to the genera *Euptychia*, *Archonias*, *Catasticta*, *Pereute*, *Enantia*, &c.; (4) that the fauna of the Atlantic slope to perhaps as far south as Costa Rica is incomparably richer than that of the Pacific, this being particularly noticeable in the Ithomiina, the Erycinidæ, the genera *Thecla* and *Papilio*, &c.; and (5) that some of the purely tropical genera do not reach north of Nicaragua, Costa Rica, or Panama, as *Eutresis*, *Scada*, *Cerois*, *Callitæra*, *Hetæra*, *Oressinoma*, *Narope*, *Panacea*, *Megistanis*, *Ilypna*, *Zeonia*, *Ithomeis*, &c.

A comparison of our fauna with that of the West-Indian Islands (from which we exclude Trinidad and Tobago, as being Venezuelan) shows the extreme poverty of the latter, the Morphinae being, so far as we know, wholly absent, and the Ithomiina, Heliconiinae, Erycinidæ, and Brassolinæ having extremely few representatives*. We are unable to give any precise statistics as regards the total number of known South-American butterflies, there being no general work on the subject; but we may note that America north of Mexico has altogether (exclusive of *Ægiale*, which in this work is included amongst the moths in the family Castniidæ) 642 species (Skinner, 1898), as against 1805 in our region. For the whole of the Palæarctic region 716 species are now known (Staudinger and Rebel, 1901). Of the total number here enumerated from Central America, 360 are described as new.

The distribution of the Rhopalocera enumerated in this work will be better understood by a few remarks on the general features of the country, the elevation of the land, the geological formation, &c. The limits of our region are as follows:—the whole of Mexico from the valleys of the Rio Grande and the Rio Gila on the north (Lower California thus being excluded), the five Central-American Republics of Guatemala, Honduras, Salvador, Nicaragua, and Costa Rica, British Honduras, and the Colombian State of Panama as far as the Isthmus of Darien. In Mexico we have the central arid tablelands, of varying extent and elevation, running from our northern limits southward to Guatemala and beyond, but interrupted at the Isthmus of Tehuantepec. The highest mountains are at no very great distance from the Mexican capital; south of this they become lower, till we reach the mainland of South America, where peaks equalling those of Mexico and much higher are again found. The snow-line in Central America is about 15,000 feet. Along both the

* Lucas has recorded two species of Erycinidæ (*Syrmatia dorylas* and *Charis ceneus*) and one of Brassolinæ (*Opsiphanes cassiæ*) from Cuba; but these statements have not been confirmed, so far as we are aware.

Atlantic and Pacific coasts there is a comparatively narrow belt of low-lying country clothed for the most part with forest; but this is interrupted in many places by savannas, especially on the Pacific slope, and "rastrojo" or second-growth woods, which are due to the land having been cleared and cultivated in former times. In the central portions of the country, where there is much less rainfall, the vegetation is poor, scrubby oaks, pines (which do not reach south of Nicaragua), euphorbias, cacti, yuccas, agaves, &c. predominating. The greater amount of rain on the Atlantic slope, as compared with that on the Pacific, also accounts for the much more luxuriant forests on that side. From Southern Nicaragua to the Isthmus of Darien the elevated land becomes less extended, till in Chiriqui there is only the central ridge.

The physical conformation of each political district, as gathered from recent works on the subject, supplemented by my own or Salvin's observations on parts of Mexico, British Honduras, and Guatemala, and those of some of our collectors in the more southern republics, may be described thus * :—

MEXICO.

Mexico stretches about 1950 miles from N.W. to S.E., with a mean breadth of 400 miles. In lat. 26° N. it is 1000 miles wide, while at the Isthmus of Tehuantepec it is but 130. A continuous mountain-range does not exist anywhere here which can properly be called the Cordillera of the Andes, an expression only current south of the Isthmus of Tehuantepec. About three-fifths of the country is occupied by a vast tableland, in the shape of a cornucopia, tapering to the south-east in the neighbourhood of Oaxaca. Scarps rise in many places considerably above the plateau, broken into ridges usually running from N.N.W. to S.S.E. The most continuous range is the Sierra Madre of the Pacific slope, which may be traced from Oaxaca to Arizona, and corresponding with it on the Atlantic side are the Sierras Madres of Nuevo Leon and Tamaulipas, at an elevation of 6000 to 7000 feet. These ridges are in many places clothed with pine and oaks; but the general character of the tableland itself is barren and arid, being only sparsely covered with acacias, cacti, agaves, yuccas, &c., while in the depressions where there is water are patches of poplars and willows. It may be well here to give the altitudes of certain points in this plateau, in order that the reader may form an idea of its average elevation: Mexico city, 7600 feet; Zacatecas, 8000 feet; the town of San Luis Potosi, 6170 feet; Durango, 6630 feet; Chihuahua,

* Further remarks on the physical features of the whole region will be found in the Appendix to the Botanical portion of this work, iv. pp. 117-315 (1887).

4600 feet; and Paso del Norte, on the United States frontier, 3800 feet, the tableland rising again and extending thence into Arizona and far beyond. Of the central cross-ridges the most important is the Cordillera of Anahuac, which surrounds the capital and Puebla, culminating with Orizaba, Popocatepetl, and Ixtaccihuatl, all reaching an altitude of over 17,000 feet, and Colima, near the Pacific, in Jalisco, of about 10,000 feet. The tableland towards both the Atlantic and Pacific coasts falls more or less suddenly, leaving a comparatively narrow belt of low-lying forest-country of varying width, which extends northward on the Pacific to slightly beyond Mazatlan, opposite the southern end of Lower California, and on the Atlantic to a little north of Ciudad Victoria in Tamaulipas, where it terminates abruptly and the northern fauna commences. At the Isthmus of Tehuantepec the Sierra Madre becomes much depressed, the ridge skirting the Pacific being only 730 feet at its highest point and the rest of the district somewhat level, but rising again in Chiapas to about 6000 feet.

The peninsula of Yucatan is comparatively flat, with a range of low hills running from the neighbourhood of Merida to near the Lake of Peten in Guatemala. Though the rainfall is considerable throughout, it rapidly filters away through the limestone substratum and the country is consequently dry.

BRITISH HONDURAS.

The coast of this colony is low, swampy, and fringed with coral-reefs, thickly covered with mangroves and tropical jungle: inland, beyond a narrow belt of rich alluvial soil, are vast tracts of sandy arid country, the elevated parts of which are called "pine-ridges," from the trees with which they are covered; and succeeding these are the "cohune ridges," with a deep rich soil covered with myriads of palm-trees (*Attalea cohune*) and other tropical vegetation. Further inland still are broad savannas studded with clumps of trees, then the Manatee Hills parallel with the coast, about 800 to 1000 feet in elevation, and to the south the Cockscomb Mountains, which reach 4000 feet; west of these there is a succession of valleys and hills and open grassy ground, from 1200 to 3000 feet in height, but of this little is known.

GUATEMALA.

In Guatemala the main chain of mountains is an extension of that of Chiapas, running throughout the length of the country in an irregular line from north-west to south-east, nearly parallel to the Pacific coast and at a distance of from 40 to 50 miles

from it. This range attains its greatest elevation in the north in the upland plains of Huehuetenango, San Marcos, and Quezaltenango, the summits of which vary in height from 7000 to 9000 feet. On the Pacific side its outline is broken near the capital by volcanoes—the “Agua,” 12,400, and the “Fuego,” 13,100 feet. The “Fuego” was made a special hunting-ground by Salvin and myself in 1861–1862 during a prolonged stay at Dueñas on the southern slope; and Mr. Champion subsequently spent some time there, as well as at Capetillo and Zapote, the last-mentioned place being on the western side. A second, or lower, range starts near Totonicapam, which forms the watershed of the Rio Negro or Chisoy and the Rio Motagua, and running past Chuacus becomes the Sierra de las Minas, dividing the Polochic from the Motagua Valley and terminating in the lower Sierra del Mico range, south of the Lake of Yzabal and the Rio Dulce. Northward, in Alta Vera Paz, especially in the neighbourhood of Coban, the land is broken into a number of abrupt or conical hills, but most of the indigenous vegetation has been cleared for the growth of coffee. Farther north still the country falls towards the Rio de la Pasion, where Salvin and I, and Mr. Champion also, spent some time collecting in the low virgin forests, which are said to extend almost without a break to the confines of the Mexican State of Campeche and British Honduras. The principal forests are to be found on the Atlantic side, chiefly in the northern part of Alta Vera Paz, and on the slopes of the valley of the Rio Polochic and its tributaries. Some parts of the interior are extremely arid, *e. g.*, the Plains (Llanos) of Salama, Zacapa, &c.

HONDURAS.

The general aspect of this country is varied by mountains and hills radiating from the common base of the Cordilleras. The main chain does not approach within 50 or 60 miles of the Pacific, nor does it maintain its general character of an unbroken range, but sometimes turns back upon itself, forming interior basins or valleys within which are collected the head-waters of the streams that traverse the country in the direction of the Atlantic. Nevertheless, as seen from the Pacific, it presents the appearance of a great natural wall, with a lower range of mountains bristling with volcanic peaks. Along the northern and eastern coasts are several bold groups of mountains, the highest reaching 8000 feet. The greater part of the country is well watered and extensive forests are said to exist in the interior, which, however, is but imperfectly known.

INTRODUCTION.

SALVADOR.

This small Republic lies south of Honduras, with which it is conterminous, and has a comparatively low seaboard of alluvial plains. It consists chiefly of a tableland of about 2000 feet in height, broken by a number of volcanic cones of more recent origin than the main Cordillera, which lies further north, within the Honduras boundary. It is well watered and the natural forests are said to have been to a great extent destroyed for the cultivation of the land. Only a very small amount of our material has been obtained here, and, judging from the configuration of the country, but little that is peculiar need be expected.

NICARAGUA.

The chief geographical feature of Nicaragua is the remarkable depression stretching from the Pacific to the Atlantic and transversely to the central plateau, which it completely interrupts. This depression lies at a mean elevation of about 100 feet above the sea-level and is partially occupied by two lakes—the smaller one, Managua, sixteen feet above the larger, Nicaragua, together stretching some 150 miles from north-west to south-east, and finally discharging their waters into the Atlantic by the San Juan River at the southern point of the Mosquito coast. The highest mountains, called the Maribros, which are insignificant in comparison with those of some of the countries here described, are chiefly clustered in the small area between the end of Lake Managua and Fonseca Bay. There are also the volcanoes of Masaya and Mombacha near Granada, and the two volcanic islands of Zapatera and Ometépe in Lake Nicaragua, the latter with its twin peaks Ometépe (4100 feet) and Madera (4190 feet), which at times are more or less active. The little-known region of rugged savannas and plateaux, beyond the mining-districts of Matagalpa and Chontales, whence the chief of our Nicaraguan collections came, occupies about one-half of Nicaragua between the lacustrine depression and the low swampy Mosquito coast; this is drained by several rivers, all flowing eastward, the chief of them being the Escondido. No certain information is available as to the distribution of forests.

COSTA RICA.

South of the lakes of Nicaragua the mountain-range rises again in the N.W. of Costa Rica and is studded with volcanic peaks. Beginning from the north, Orosi

(5200 feet), Miravalles, Poas (8845 feet), Irazu (11,500 feet), and Turrialba (10,330 feet) are the highest summits. Southern Costa Rica is marked by the range called the Montaña Dota, 7000 to 9000 feet, running east and west, from which two branches extend, one close to the Pacific, the other stretching across the centre of the country, culminating in its highest points the Cerro Chiripo and Pico Blanco (11,700 feet above the sea). Between these northern and southern masses is the tableland of Cartago, which has an elevation of from 3000 to 4000 feet and forms the most cultivated part of the country. In contrast to the south-western, which is characterized by Savannas (Llanos) bordered by forest, the Atlantic slope is covered in great part with an impenetrable jungle. The mountains generally have been cleared of wood to about 6000 or 7000 feet, especially on the southern side.

PANAMA.

Panama, including Veraguas and Chiriqui, forms the most northern of the United States of Colombia. The Cordillera attains a height of 11,265 feet, in the Volcano of Chiriqui, becoming lower towards the Isthmus, till at Culebra, where the railway crosses, it is only about 300 feet. The climate is excessively wet and the vegetation, especially on the Atlantic slope, is most luxuriant, the mountains being clothed with dense forest; in the month of March, at the height of the dry season, when the "northers" are blowing and bush-fires burning in all directions, most of the country, however, appears very dry. On the Pacific side there are extensive savannas, and all the towns and villages are in the low land, the only inhabitants in the mountains of Chiriqui being the coffee-planters and their employés, people looking after cattle, and (towards Veraguas) a few Indians, who, not living in villages, are rarely seen. The country adjoining the Costa Rican boundary is clothed with dense forest, and this continues more or less interruptedly to beyond the town of David, the "montaña" (or forest) of Chorchá extending to the Pacific coast. On the southern side of the Volcan de Chiriqui the forest commences at about 2500 feet, 8000 being the greatest height reached by our collectors.

As might be expected from the foregoing description of a region embracing such a diversity of high mountains, elevated plains, and low valleys, and with an extremely varied rainfall, we find very great differences of climate and conditions, widely affecting the vegetation and the distribution of the insect-fauna.

The classification adopted is in the main that of H. W. Bates, as given in his paper

on the "Insect Fauna of the Amazon Valley" [Journal of Entomology, ii. pp. 175–185 (1864)], except that the Morphinae are retained as a separate subfamily of the Nymphalidae, and the Libytheidae as a family distinct from the Erycinidae. Six families are therefore recognized—the Nymphalidae, Libytheidae, Erycinidae, Lycænidae, Papilionidae, and Hesperidae, most of these being again divided into subfamilies, &c. Some remarks on the Central-American species of these families and of their habits and distribution are appended.

NYMPHALIDÆ.

This family we have divided into seven subfamilies—Danainæ, Satyrinæ, Morphinae, Brassolinæ, Acræinæ, Heliconiinae, and Nymphalinae.

The Danainæ include two groups, the Danaina and the Ithomiina. The first of these, which is very numerous in the Ethiopian and Oriental regions, is represented in Central America by three genera: *Danaïs* (in the broad sense), widely distributed over the warmer parts of the world (one species, *D. plexippus*, apparently spreading more and more every year), *Ituna*, and *Lycorea*, the last two being strictly neotropical. The Ithomiina include twenty-three genera, but few of the South-American ones being absent, and *Pteronymia*, *Ithomia*, and *Hymenitis* are each represented by a considerable number of species. They are all neotropical, the last-named genus extending to the Antilles, where we find the islands of Cuba, Jamaica, and Haiti each with its single peculiar species. *Eutresis*, *Scada*, *Epithomia*, and *Heterosais* do not reach north of Costa Rica or Panama. *Dircenna* has been recorded from Rio Grande, Texas, and *Ithomia* and *Mechanitis* from Los Angeles, in California; but as they have not come under our notice from either the north-eastern or north-western parts of Mexico, it seems probable that a mistake has been made about these localities, or that the insects may have been accidentally introduced. They are all of weak flight and live mostly in the deep shade of tropical forests, and are therefore unlikely to occur in the United States of North America. A good many have diaphanous wings, a character also common to a few of the Satyrinæ and Dismorphiina of the same region. In certain genera, *Mechanitis*, &c., many of the so-called species appear to be imperfectly segregated, as is the case with some of the similarly-coloured Heliconiinae, which do not always vary according to locality; others, again, exhibit a homœochromatic *

* We called these "homœochromatic associates," when writing on the species of the genus *Eresia* in this work, in 1882 (I. pp. 184, 185, 188), and Mr. W. F. H. Blandford (Proc. Ent. Soc. London, 1897, p. xxii) subsequently used the term "homœochromatism" for this form of reciprocal mimicry.

style of marking common to various butterflies inhabiting the same districts. The Ithomiina appear to be replaced in the Oriental region by *Euplœa* and its allies, which belong to the group Danaina.

The Satyrinæ inhabiting Central America are distributed by us under sixteen genera, all South-American but three; two of these, *Paramecera* and *Drucina*, have not been recorded from outside our limits, and the third, *Gyrocheilus*, is apparently confined to Mexico and the United States. Nearly half the total number of species are referred to *Euptychia*, which extends north of the Mexican frontier, as well as into South America. Of this subfamily various southern genera do not reach our region, as *Steroma*, *Dædalma*, *Lasiophila*, *Corades*, *Bia*, &c., though most of these are represented in the northern part of the South-American continent. So far as we are aware, three only of the Central-American genera of this subfamily have been recorded from the West-Indian Islands, and these have never been confirmed. The transparent-winged forms, *Callitæra*, &c., are not found north of Nicaragua, and *Cærois*, *Oressinoma*, and *Pronophila* only enter the southern part of our country. *Lymanopoda*, *Pedaliodes*, *Oxeoschistus*, *Pronophila*, and *Drucina* inhabit the forest-clad mountain-slopes of the Cordillera at a considerable elevation; and *Antirrhæa*, *Hetæra*, *Pierella*, and *Callitæra* frequent shady places in dense forest at a lower altitude. Some of the species are extremely local, e. g., *Drucina championi* and *Euptychia nelsoni*, conspicuous forms which are only known from a very restricted locality on the Pacific slope of Guatemala. *Taygetis* includes some very variable forest-species, their wings on the underside resembling dead leaves.

The Morphinæ are represented by the single well-known genus *Morpho*, of which we have mentioned nine species as occurring in Central America, less than half of these reaching Guatemala. Its northern limits—Tampico on the Atlantic side (*M. peleides*) and Mazatlan on the Pacific (*M. polyphemus*)—indicate very clearly where the tropical insect-fauna ceases, though southwards the genus extends to the Argentine Republic. These magnificent butterflies are eminently characteristic of Tropical America, there being nothing quite analogous to them in the warmer parts of the Eastern Hemisphere; all the Old World Morphinæ are of a different type, and in general appearance more like some of the Brassolinæ. The beautiful, delicate, opalescent forms apparently do not reach so far north as the Isthmus of Panama, though we possess a specimen of *M. sulkowskii* labelled "Costa Rica," but this locality requires confirmation. The pearly-white *M. polyphemus*, which is not

uncommon in Mexico and Guatemala, and ascends to a considerable elevation, is, we believe, confined to our region, and its nearest ally *M. laertes* inhabits South Brazil, there being no representative of this group in the intervening country.

The Brassolinæ are confined to the New World, and include some of the largest of the American butterflies, which belong to the genus *Caligo*, as well as others of smaller size, six genera being represented. Unlike the Morphinæ, they are nearly all of crepuscular habits, flying but little during the hottest hours of the day, and when disturbed making for the nearest tree-trunk, usually in the dense growth; *Narope* has even been attracted by light, like a moth. The genera are all tropical, four of them reaching Southern Mexico, the other two not extending north of Nicaragua or Costa Rica. In the eastern tropics this group appears to be replaced by *Thaumantis*, *Tenaris*, *Discophora*, &c., of the subfamily Morphinæ.

The Acræinæ are numerous in species in Central and South Africa and Madagascar, as well as in certain parts of South America, but within our limits very few are found, four only being known to us, and one of these is but doubtfully distinct. The American forms have been separated from *Acræa* under the generic name *Actinote*. The paucity of species in Central America is, however, compensated by the abundance of individuals of one or two of them.

The Heliconiinæ, like the Brassolinæ, are all American, and characteristic inhabitants of the tropical portions of the New World. The two genera, *Heliconius* and *Eueides*, extend throughout the whole of our region, and also occur in the Antilles, the first-mentioned reaching the United States. Some of the species are very variable in colour, especially *H. erato* and the forms mimicking the Danaine genera *Mechanitis*, *Thyridia*, *Tithorea*, &c. We recognize twenty-eight species of *Heliconius* and seven of *Eueides* from Central America. There seem to be no corresponding forms replacing this subfamily in the warmer parts of the Old World.

The Nymphalinæ include some of the most widely distributed forms amongst the butterflies, and are particularly numerous in Central America, no fewer than fifty-seven genera being here recorded. Amongst those not confined to America are *Eurema*, *Vanessa*, *Grapta*, *Pyrameis*, *Junonia*, *Argynnis*, *Melitæa*, and *Limenitis*; some of these, however, are holarctic, merely extending down the central plateau to Mexico or Guatemala. *Phyciodes*, *Anæa*, *Adelpha*, *Synchlœ*, *Eunica*, *Eresia*, *Eubagis*, *Timetes*, and *Catagramma* are each represented by numerous species. Of the

essentially tropical genera, those found in the Southern United States are:—*Colænis*, *Agraulis*, *Phyciodes*, *Anartia*, *Eunica*, *Peridromia*, *Victorina*, *Cystineura*, *Timetes*, *Adelpha*, *Aganisthos*, and *Anæa*; *Microtia*, *Myscelia*, *Eubagis*, *Callicore*, *Ageronia*, *Didonis*, *Chlorippe* (as understood by us), *Prepona*, and *Smyrna* do not reach beyond Northern Mexico; *Metamorphæa*, *Hæmateræa*, *Ectima*, *Pycina*, and *Hypnæa* inhabit the southern portion only of Central America, and *Panacea* just touches our southern boundary. The most conspicuous South-American forms wholly absent are *Callithea*, *Batesia*, *Perisama*, and *Cybdelis*. The holarctic genera extending southward are *Argynnis* (which has only come under our notice from Northern Mexico during recent years), *Melitæa*, *Vanessa*, *Grapta*, *Limenitis*, and *Doxocopa*. Of those widely distributed and common to both the Nearctic and Neotropical regions may be mentioned *Synchlora*, *Euptoieta*, *Phyciodes*, *Pyrameis*, and *Junonia*. So far as at present known, *Morpheis* and *Bolboneura* are peculiar to Mexico or Guatemala. Twenty-seven at least out of the total number of genera (57) are common to the Antilles.

These insects are nearly all strong on the wing, but are of very diverse habits. The species of *Ageronia*, *Peridromia*, *Ectima*, *Gynæcia*, and *Callizona* have the habit of resting on tree-trunks, with their wings fully extended horizontally (placing them vertically when disturbed), after the manner of various Geometrid moths, or of the Noctuid genus *Thysania*, those of the first two invariably turning their heads towards the ground. Others, *Chlorippe*, *Aganisthos*, *Victorina*, *Amphirene*, *Timetes*, *Adelpha*, *Colænis*, *Eresia*, *Phyciodes*, *Eubagis*, *Pyrrhogyra*, *Callicore*, *Catagramma*, &c., frequent the pools left in the water-courses during the dry season, as well as the refuse cane thrown out from the sugar-mills, damp places in the roads, &c.; while *Siderone*, *Anæa*, and *Protopogonius* resort to moist spots, dung, &c., amongst dead leaves. *Timetes chiron*, like the moth *Uranidia fulgens*, has been noticed by various observers migrating in great numbers; but it is possible that most or all of these specimens are of the male sex, the females of this genus being rarely found. Various species of *Anæa* frequent the tops of trees, only descending occasionally to damp spots in the vicinity, and some of the most interesting forms of Nymphalinae peculiar to Central America belong to this genus, viz. *A. nobilis*, *A. excellens*, and *A. jansonii*; *Agrias ædon* has been observed by Arcé in Chiriqui to have the same habit.

LIBYTHEIDÆ.

The only known genus of this family, *Libythea*, is of very wide distribution, as we have already stated in our remarks on these insects (I. p. 359). The single species

inhabiting our region extends northward to Arizona, New Mexico, and Texas, and southward to the Argentine Republic. It is replaced by allied forms in the West-Indian Islands.

ERYCINIDÆ.

The headquarters of the Erycinidæ are in Tropical America, where an immense number of species are found, the Oriental region having comparatively few representatives. We recognize forty-eight genera in Central America, all but two of which (*Apodemia* and *Polystigma*) occur also in South America, where many others not entering our region are to be met with, the most conspicuous of these being *Helicopsis*, *Stalachtis*, *Syrmatia*, *Barbicornis*, *Amarynthia*, and *Zelotæa*. Five extend to the United States, two of which (*Apodemia* and *Polystigma*) are not found south of Mexico, the other three (*Eurygona*, *Charis*, and *Emesis*) being common to North, Central, and South America; eight reach Northern Mexico only, and fifteen stop in Nicaragua, Costa Rica, or Panama. So far as we know, the Erycinidæ are almost wanting in the West-Indian Islands (exclusive of Trinidad and Tobago), two or three species only having been recorded and these not confirmed. Notwithstanding their small size, these are certainly the most interesting of all the Tropical-American butterflies, and from their diversity of form and colour they have always attracted the attention of travellers, among others that of H. W. Bates, who collected and made observations on the very numerous species inhabiting the Amazons Valley. The most remarkable genera known from Central America are: *Erycina*, *Diorhina*, and *Zeonia*, which have the general appearance of a small-tailed *Papilio*; *Anteros*, with metallic spots on the underside of the wings; *Caria*, with metallic lines and patches above; *Ithomeis*, a mimetic form resembling certain Ithomiina; *Mesenopsis*, *Lepricornis*, and *Aricoris*, the species of which are very like various day-flying moths inhabiting the same districts; *Hades*, an insect very similar in colour, both above and beneath, to the Nymphalid genus *Morpheis*, both monotypic forms, the first-mentioned, however, having a much more extended distribution; and *Theope*, most of the species of which bear a great resemblance to various *Theclæ* occurring in the same localities.

To show the poverty of the Erycinidæ north of our boundary, it may be noted that eleven species only are enumerated by Skinner in his recent Catalogue (Syst. Cat. N. Am. Rhopalocera, 1898), as against our 240. Most of these insects are confined to the "tierra caliente," or low country, and are of very retiring habits, constantly resting on the undersides of leaves, some of them being only seen during the very short period

when certain trees are in flower. The Central-American species belong to two subfamilies, the Nemeobiinæ and the Erycininæ, all but three of the genera belonging to the latter.

LYCÆNIDÆ.

Under this head we have placed six genera: *Thecla* (in the wide sense), including upwards of 200 species; *Lycæna*, which is very poorly represented, as is the case all through Tropical America, thirteen species only occurring within our limits; *Theorema*, *Theclopsis*, and *Chrysophanus*, each containing one or two species only, and the latter probably not really congeneric with the typical Palæarctic and Nearctic forms of that genus; and *Eumæus*, with two species. *Theorema* and *Theclopsis* are common to Central and South America; *Eumæus* extends north and south of our region, and also occurs in the Antilles; the insect provisionally referred to *Chrysophanus* is peculiar to Guatemala; *Thecla* and *Lycæna* are generally distributed. We have already spoken of the great diversity amongst the species of *Thecla*, and it, no doubt, requires subdivision. In North America this genus still outnumbers *Lycæna*, the former having fifty-six and the latter forty-eight species, as given in Skinner's catalogue, whereas in Central America the numbers are 215 and 13 respectively. There is a difference of opinion as to the true position of *Eumæus*, and an interesting note by Mr. S. H. Scudder (*cf.* II. pp. 110–112) has been added to our remarks on the genus.

PAPILIONIDÆ.

The Papilionidæ include two subfamilies—the Pierinæ and the Papilioninæ; the first-mentioned dividing into two groups, the Pierina and the Dismorphiina. Of the Pierina, seventeen genera are mentioned by us as inhabiting Central America. *Pereute*, *Leodonta*, *Catasticta*, and *Archonias* frequent the forest-clad slopes of the Cordillera, some of the species attaining a high elevation. *Eucheira* is confined to elevated districts on the plateau of Mexico, living in oak-forests. *Hesperocharis* affects mountainous places, and ranges from South Mexico to the Argentine Republic, about one-third of the known species occurring within our limits. The remainder—*Pieris*, *Callidryas*, *Colias*, *Terias*, *Nathalis*, &c., all widely distributed—frequent open places, *Terias* and *Pieris* being each represented by numerous species. The typical forms of *Colias* in the New World mainly inhabit North America and the Andes. *C. cæsonia*, which is of a somewhat different type, lives in both the low country and the mountains, extending northward to the Eastern United States and southward to Bolivia; the two

others, *C. chrysotheme* and *C. philodice*, continue down the central plateau to Mexico or Guatemala. *Callidryas* and its allies are perhaps the most conspicuous of the Central-American Pierinæ, and they congregate in large numbers, with various species of *Terias*, *Papilio*, &c., on the banks of rivers and ponds, or in wet places in the roads, especially in the dry season, when compact masses of them on a space a foot or so in diameter are often seen. *Archonias dimorphites*, *A. lyceas*, *A. nigrescens*, and the females of certain species of *Pieris* (*P. malenka*, &c.), as well as *Enantia deione* (of the group Dismorphiina), resemble in their style of coloration various Ithomiina and Heliconiina inhabiting the same places. The females of the *Pieris* mentioned also have narrower wings than the males, the mimicry thus being still more accentuated. *Archonias approximata*, again, has the coloration of *Papilio mylotes*, and inhabits much the same localities.

The Dismorphiina, a purely Neotropical group, are represented by four genera, most of the species frequenting forest-districts. In their elongated wings (which in some forms are diaphanous) and in their weak flight they exactly resemble certain species of the Danaine group Ithomiina, nearly each genus of which is, as it were, duplicated amongst the Dismorphiina, as noticed by Bates on the Amazons and mentioned by him in his paper on "Mimetic Resemblance." They are characteristic of the Tropical-American fauna, though more frequent on the mountain-slopes than in the low ground; our genera are all South-American, *Dismorphia* reaching North Mexico and *Enantia* extending a little north of the Mexican boundary, where possibly it is not really indigenous.

The Papilioninæ include two genera only—*Papilio*, in the wide sense, which is universally distributed, and *Baronia*, the latter represented by a single species peculiar to the Sierra Madre del Sur, Western Mexico. The gigantic *Ornithoptera* of the eastern tropics are altogether absent in America; but this deficiency is richly compensated for by the abundance and variety of *Papilio*, upwards of eighty species occurring within our limits. These we have divided into thirteen groups, the typical representatives of which are *zestos*, *montezuma*, *mylotes*, *polydamas*, *thymbræus*, *protesilaus*, *thoas*, *epidaurus*, *pandion*, *zagreus*, *eurotas*, *asclepius*, and *daunus* respectively. It is worth while to again call attention to the dimorphism amongst the females of some of the South-American species of the *P. epidaurus*-group, a peculiarity not shared by the Central-American forms, and to note the resemblance of *P. zalates* (of the *P. zagreus*-group) to some of the Danaine forms, e. g. *Lycorea*. The genitalia of the males of many of them are figured on our Plates. The true affinities of

Baronia have still to be ascertained. The only genera of this subfamily in North America are *Papilio*, with twenty-three species, as against our eighty-four, and *Parnassius*, including four alpine forms; the last-mentioned altogether absent in Mexico, but perhaps represented by *Baronia*.

HESPERIIDÆ.

The Hesperiidæ are represented by nearly as many species as the Nymphalidæ, Tropical America being especially rich, such a great variety occurring in a very limited district that a collector in almost any locality in the low country (except at the height of the dry season) may obtain examples of many different forms in a single day's excursion. Upwards of 550 species are here recorded, and possibly double that number are to be found on the South-American continent (though many of these latter are still unnamed in collections), belonging to three subfamilies—the Pyrrhopyginæ, the Hesperiinæ, and the Pamphilinæ. Of the total, rather more than half belong to the Hesperiinæ, and the bulk of the others to the Pamphilinæ, the Pyrrhopyginæ having only thirty representatives. The Hesperiidæ, it may be noted, are also very numerous in America north of Mexico—178 species (exclusive of *Ægiale*) being recorded (Skinner, 1898), as against forty-six for Europe in the wide sense (Staudinger, 1871), and sixty-six for the whole of the Palæarctic region (Staudinger and Rebel, 1901). The “skippers” have a wider distribution than most butterflies; this may be accounted for, no doubt, by their strong powers of flight and their habit of frequenting comparatively open places. A very large number of the species are common to our region and the northern part of South America.

We have already commented on the difficulty of dealing with the members of this family, especially with regard to the characters that should be used for generic separation, and more particularly in connection with the Pamphilinæ, the time required for the study of these latter having much delayed the completion of our enumeration of the Rhopalocera.

The Pyrrhopyginæ, a Neotropical group, include the well-known genus *Pyrrhopyge* and its allies, all insects of large size and robust build. Of the nine genera inhabiting Central America, one, *Pyrrhopyge*, reaches a little beyond our northern frontier, *Mysoria* extends to Northern Mexico, *Azonax* is peculiar to Nicaragua, *Amenis* and *Oxynetra* occur in Chiriqui, and the others range from South Mexico or Guatemala to

the South-American continent. About 100 species are known, nearly one-third of which occur in our region.

The Hesperiinæ we have divided (following Watson) into two groups—the one almost exclusively American, the other being generally distributed, though more numerous represented in Tropical America than elsewhere. Amongst the genera including the largest number of species are *Eudamus* (which has a very wide distribution), *Staphylus*, *Thymele*, *Pythonides*, *Telegonus*, and *Pellicia*; a few are confined to Mexico and the Southern United States, as *Thorybes*, *Cocceius*, *Pholisora*, and *Celotes*; but the majority are strictly Neotropical, extending northward to Guatemala or South Mexico, a few, like *Dyscophellus*, *Paramimus*, and *Timochreon*, only reaching the State of Panama.

The Pamphilinæ, as shown by our critical study of them, divide by their sexual characters &c. into a great number of small groups, some monotypic, others including two, three, or more species, to which we have reluctantly given generic value. No attempt has yet been made to classify the whole of the known South-American forms, and a comparison with them cannot therefore very well be made. We have, however, traced most of our numerous genera south of Panama, and many of those recorded by us from Central America only will no doubt eventually be found represented on the southern continent. Of our total number, twenty-two at least also inhabit the United States, and some few, *Oarisma*, *Ochlodes*, *Phycanassa*, *Atrytonopsis*, *Stomyles*, *Amblyscirtes*, and *Mastor*, are peculiar to that country and Mexico; the remainder are strictly Neotropical, a good many not reaching north of the State of Panama.

The genera most numerous in species are *Thracides*, *Atrytone* (common to the tropical and temperate regions of the New World), *Butleria* (extending southward to Chile), *Carystus*, *Eutychide*, *Megistias*, and *Prenes*, the last-mentioned being very widely distributed. The distribution in America of *Pamphila* (as restricted by Watson) is somewhat peculiar, viz., United States, Mexico, and Brazil, the species from the two last-mentioned countries being exceedingly closely allied. *Pyrrhopygopsis* in appearance closely resembles *Pyrrhopyge* and *Phocides*, but has the neururation &c. of the Pamphilinæ. The most striking Central-American forms of this subfamily belong to *Thracides*, *Perichares*, *Talides*, *Aides*, *Orses*, *Lycas*, and *Dion*, nearly all of which are purely Neotropical.

The Table given on the following pages (pp. xxii-xxvii) will show the distribution of the genera in the eight divisions into which we have for convenience divided our region *, as well as their extension north and south, and their representation in the West-Indian Islands (exclusive of Trinidad and Tobago); but it must be observed that we have insufficient data for a trustworthy comparison with the Antillean fauna †. The gaps in the distribution of the widely-ranging Neotropical forms merely indicate that we have not yet received specimens from those districts.

An enormous number of specimens have passed through our hands for the purposes of this work, including many lent by the late Dr. Staudinger, principally from Chiriqui, and by Mr. Schaus, from Mexico. They have been contributed mainly by the following collectors:—From Mexico by Messrs. Baron, Becker, Brooks, Buchan-Hepburn, Elwes, Fenochio, Forrer, Gaumer, Höge, Mathew, Morrison, Richardson, Rümeli, Schumann, H. H. Smith, Trujillo, J. J. Walker, and myself; from British Honduras by Messrs. Blancaneaux and Roe; from Guatemala by Messrs. Champion, Conradt, Hague, Salvin, and myself; from the Republic of Honduras (including Ruatan Island) by Messrs. Gaumer, Whitely, and Wittkugel; from Nicaragua by Messrs. Belt, Janson, and Richardson; from Costa Rica by Messrs. Rogers, Van Patten, and Zurcher; from Panama (including Taboga and the Pearl Islands) by Messrs. Arcé, Champion, McLeannan, Ribbe, Trötsch, and J. J. Walker.

Mr. Smith collected in Mexico, in 1888-89, chiefly at the following places:—Atoyac, at the foot of the eastern slope of the Volcan de Orizaba, Teapa in Tabasco, various localities in Guerrero (from an elevation of nearly 10,000 feet down to Acapulco on the Pacific coast), Cuernavaca, &c. Mr. Richardson was mostly engaged in ornithology, but he sent us various butterflies from time to time, chiefly from the Mexican State of Tamaulipas and from Matagalpa in Nicaragua. Mr. Schaus's and Mateo Trujillo's collections were made mainly at Jalapa, Coatepec, Cordova, and Misantla, in Vera Cruz, the most productive district in Mexico for butterflies. Most of these places, as

* Salvador cannot be included, owing to want of sufficient material; the Rhopaloceros fauna, however, so far as we know, is very similar to that of the central portions and Pacific slope of Guatemala. Mazatlan and Tampico are grouped with Northern Mexico.

† The only list of any importance is that of Lucas, in Ramon de la Sagra's work on the Natural History of Cuba, but several of the South-American species enumerated by him from that island have not again been recorded from there. We have, however, included them in the Table on his authority, but with a ?.

Geographical Distribution of the Genera of RHOPALOCERA represented in Mexico and Central America §.

	N. America.	N. Mexico.	S. Mexico.	Brit. Honduras.	Guatemala.	Honduras.	Nicaragua.	Costa Rica.	Panama.	Tropical S. America.	W. Indies.	Total number of C-Am. species.
DANAIDÆ. Danaids.	*	*	*	*	*	*	*	*	*	*	*	4
{ Danaid† Ituna Lycorea Olyras Eutresis Tithorea Melinaea Scada Aeria Thyridia Mechanitis Ceratonia Napeogenes Direcna Callichromia Epithomia Calloleria Hypoecada Leucothyris..... Episcada Pteronymia..... Ithomia ? { Hypocleria Pseudoscada Hymenitis Heterosais	*	*	*	*	*	*	*	*	*	*	*	1 1 1 1 7 1 1 1 1 2 6 7 4 5 4 1 2 2 7 2 15 9 5 1 9 2
Ithomiini.	?	*	*	*	*	*	*	*	*	*	*	106
SATYRINÆ.	Cerois Callithea Heterea Pierella Antirrhæa	?	?	?	?	?	?	?	?	?	?	1 2 1 1 4 3

INTRODUCTION.

xxiii

Tisiphone	...	*	...	*	...	*	...	*	...	2	Prepona	...	*	...	*	...	?	8
Oressinoma	...	*	...	*	...	*	...	*	...	1	Aganishos	...	*	...	*	...	*	1
Euptychia	*	*	*	*	...	*	...	*	...	43	Cocæ	...	*	...	*	...	*	1
Taygetis	...	*	...	*	...	*	...	*	...	9	Megastanis	...	...	...	*	...	*	1
Paramevera	...	*	...	*	...	*	...	*	...	1	Agrias	...	...	...	*	...	*	1
Lymanopoda	...	*	...	*	...	*	...	*	...	2	Smyrna	...	...	...	*	...	*	2
Petaloides	...	*	...	*	...	*	...	*	...	8	Pycna	...	...	...	*	...	*	1
Gyrochelis	*	*	...	*	...	*	...	*	...	1	Siderone	...	...	...	*	...	*	5
Oxoschistus	...	*	...	*	...	*	...	*	...	8	Anæa	...	...	...	*	...	*	37
Pronophila	...	*	...	*	...	*	...	*	...	1	Hypna	...	...	...	*	...	*	1
Drucina	...	*	...	*	...	*	...	*	...	2	Protopogonius	...	...	...	*	...	*	2
MORPHINE.																		
Morpho †	...	*	...	*	...	*	...	*	...	9	LIBYTHEIDÆ.	...	*	...	*	...	*	319
BRASSOLINE.																		
Dynaetor	...	*	...	*	...	*	...	*	...	2	ERYCINIDÆ.	...	*	...	*	...	*	1
Brassolis	...	*	...	*	...	*	...	*	...	1	NEMEOBINÆ.	...	*	...	*	...	*	1
Opsiphanes	...	*	...	*	...	*	...	*	...	?	Eurygona	...	*	...	*	...	*	22
Caligo	...	*	...	*	...	*	...	*	...	11	Methonella	...	*	...	*	...	*	1
Eryphanis	...	*	...	*	...	*	...	*	...	3	Hades	...	*	...	*	...	*	1
Narope	...	*	...	*	...	*	...	*	...	2								
ACELINEÆ.																		
Actinote	...	*	...	*	...	*	...	*	...	?	Erycininæ.	...	*	...	*	...	*	24
HELCIONINÆ.																		
Heliconius	*	*	...	*	...	*	...	*	...	28	Eurybia	...	*	...	*	...	*	5
Eueides	...	*	...	*	...	*	...	*	...	7	Mesoemia	...	*	...	*	...	*	16
NYMPHALINE.																		
Metamorphia	...	*	...	*	...	*	...	*	...	35	Crenna	...	*	...	*	...	*	2
Colenis	*	*	...	*	...	*	...	*	...	1	Zeonia	...	*	...	*	...	*	1
Agraulis	*	*	...	*	...	*	...	*	...	2	Diorhina	...	*	...	*	...	*	3
Clotilda	...	*	...	*	...	*	...	*	...	3	Erycina	...	*	...	*	...	*	3
Euptoieta	...	*	...	*	...	*	...	*	...	2	Lyropteryx	...	*	...	*	...	*	1
Synchlœus	*	*	...	*	...	*	...	*	...	14	Necyria	...	*	...	*	...	*	3
Eresia	...	*	...	*	...	*	...	*	...	13	Monethe	...	*	...	*	...	*	1
Argynnis †	...	*	...	*	...	*	...	*	...	13	Nothene	...	*	...	*	...	*	1
Melitæa †	*	*	...	*	...	*	...	*	...	2	Cyrenia	...	*	...	*	...	*	1
Phyciodes	...	*	...	*	...	*	...	*	...	4	Libomeis	...	*	...	*	...	*	1
Microtia	...	*	...	*	...	*	...	*	...	40	Tinctoglene	...	*	...	*	...	*	3

§ The genera marked with a † are not confined to America.

† Extends southward to the Argentine Republic.

Geographical Distribution (continued).

[illegible]

[illegible]

[illegible]

Nymphalidæ.....	588
Libytheidæ	1
Erycinidæ	240
Lycenidæ.....	234
Papilionidæ	186
Hesperidæ	556
	1805

well as Puebla, Amecameca, the Volcanoes of Popocatepetl and Ixtaccihuatl, and Orizaba, were visited by myself in 1887–88, in company with Mr. Elwes. I also made an expedition to Tabi, Ticul, Valladolid, and other places in Northern Yucatan. M. Blancaneaux, in British Honduras, collected in the vicinity of Belize, on the rivers Hondo and Sarstoon, and at Cayo in the Western District. Salvin's three visits to Guatemala, in one of which I accompanied him, were chiefly devoted to ornithology, but he obtained many butterflies during his travels, particularly at Dueñas, near Antigua, San Gerónimo, in Baja Vera Paz, the coffee-estate of "Las Nubes" (on the Pacific slope, generally termed Cerro Zunil in this work, to avoid confusion with another place of the same name near the capital), Choctum in Alta Vera Paz, and the Polochic Valley. On his way home he collected a few insects along the Line of the Panama Railroad, where he met M'Leannan, from whom we afterwards received many interesting butterflies. Salvin also made a journey to Peten, from Coban, returning again to the city of Guatemala by way of Belize and Yzabal, but on this trip he paid but little attention to entomology. Enrique Arcé was engaged by us during our joint visit to this country, and we afterwards sent him to Chiriqui and Veraguas, in the State of Panama. Mr. Champion, in Guatemala, collected in the Polochic Valley, the Senahu and San Juan district to the north of it, and Sabo, Panima, Sinanja, &c. to the south; Cubilguitz, Cahabon, Lanquin, Chiacam, Coban, Tactic, Purula, San Gerónimo (where he had his headquarters for one year), &c., in Vera Paz; the Los Altos region (Quezaltenango, Ostuncalco, Totonicapam, Quiché, &c.); the neighbourhood of Antigua, including the Volcanoes Agua and Fuego, and of the capital; and almost the entire length of the Pacific slope, from the El Tumbador district in San Marcos to the Rio Maria Linda, including the Rio Naranjo, Coatepeque, Champerico, Retalhuleu, San Isidro, Las Mercedes, Cerro Zunil, El Idolo, the Lake and Volcano of Atitlan, San Agustin, Pantaleon, Zapote, Mirandilla, Torola, San José, Paso Antonio, &c. In the State of Panama his investigations, like those of Ribbe, Trötsch, and Arcé, were limited to the Pacific slope (Vivala, Alanjé, Bugaba, David, Caldera, Los Remedios, Tolé, Peña Blanca, the eastern, southern, and western slopes of the Volcan de Chiriqui, &c.); but he also visited Taboga and the Pearl Islands, the neighbourhood of the city of Panama, Colon, &c. Mr. Rogers devoted his attention to various places in Costa Rica—the Volcan de Irazu, Caché, Rio Sucio, &c.

Messrs. Arcé, Champion, Richardson, Rogers, Smith, and Trujillo were specially employed by us in various countries as collectors, subsequent to the visit of Salvin and myself to Guatemala in 1861, their several expeditions extending over nearly forty years.

Additions may yet be expected from the Atlantic slope of Chiriqui, in the State of Panama, and from the Isthmus of Darien, districts almost unworked; and, to judge from a small collection made by Mr. Becker in the neighbourhood of Durango city, other northern forms are likely to occur in that part of Mexico.

Two important collections of Rhopalocera acquired long ago by us have been of great assistance in working out the Central-American species, viz., that of H. W. Bates, including the first set of his captures on the Amazons (in all 11,450 specimens), and that of Herbert Druce, containing the types of many Costa Rican insects described by Dr. Butler and himself. The late Dr. Staudinger, to whom our thanks are due, communicated numerous types of Mabille and Herrich-Schäffer, so that we have been able to determine with certainty many of the species described by these authors; we are also indebted to M. Charles Oberthür, of Rennes, for assistance in the identification of various insects described by Boisduval. On the other hand, all our attempts to obtain the loan of Plötz's quoted (but unpublished) figures of Hesperiidæ were unsuccessful, and we have been compelled to leave many of his species unidentified, the descriptions being in most cases inadequate for the purpose. I must also here record my special thanks to Mr. Champion for the valuable assistance he has rendered me, especially in the completion of the Hesperiidæ, since Salvin's death.

Following our usual custom, we have given a distinctive specific name, in preference to a varietal one, to such forms (more especially in the genus *Papilio*) as seemed to be confined to a particular district, even if the differences were not very important. Since we attach but very little value to relative size, no measurements have, as a rule, been given; our numerous figures, however, which are all drawn natural size when the entire insect is shown, will supply this deficiency. Where no sex is mentioned in the diagnosis, it must be understood that the characters are in almost every case taken from the male.

Of the 113 hand-coloured Plates (including XXIV. *a*), thirty-four were drawn by Mr. R. F. H. Rippon, the remainder by Mr. W. Purkiss, illustrating altogether about 1250 species. The dissections of the genitalia and other preparations were made either by Mr. A. Cant or by Salvin himself.

In conclusion, it is a matter of regret that Dr. Holland's excellent work on North-American butterflies, the second edition of which was published in 1900, reached us

too late to be of use in the preparation of the concluding portion of these volumes. Had we received it sooner, much labour would have been saved and some of the more critical northern forms identified with greater certainty, especially among the Hesperiidæ which extend down the central plateau.

F. D. G.

November 1901.

LIST OF PLATES.

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
NYMPHALIDÆ.				<i>Leucothyris vicina</i> , ♂	III.	18	i. 39, ii. 6
DANAINÆ.				— æsion , ♂	II.	4	i. 40, ii. 6
<i>Olyras theon</i> , ♂	I.	2	i. 7, ii. 639	— pagasa , ♂	III.	15	i. 41, ii. 6
— insignis, ♂	I.	1	i. 8	<i>Episcada salvinia</i> , ♀	III.	19	i. 41, ii. 6
<i>Eutresis theope</i>	I.	3	i. 9	<i>Pteronymia artena</i> ††, ♂ ♀	IV.	10, 11	i. 42, ii. 6
<i>Tithorea duenna</i> , ♀	II.	7	i. 9, ii. 640	— alemena , ♀	V.	1	i. 43, ii. 6
— pinthias, ♀	II.	8	i. 10	— parva , ♂	V.	2	i. 44, ii. 6
— salvadoris *, ♀	II.	9	i. 11, ii. 641	— simplex , ♀	III.	20	i. 45, ii. 6
— irene, ♀	II.	10	i. 11	— rufocincta , ♂	III.	21	i. 46, ii. 6
<i>Melinæa scylax</i> , ♂	II.	12	i. 12, ii. 641	— fulvescens, ♂ ♀	IV.	8, 9	i. 47, ii. 6
— imitata, ♂	II.	11	i. 13, ii. 641	— agalla, ♂ ♀	IV.	6, 7	i. 47, ii. 6
<i>Scada xanthina</i> †, ♂	III.	2	i. 14	<i>Ithomia panamensis</i> ‡‡, ♀	V.	3	i. 48, ii. 6
<i>Æria agna</i> ‡, ♂	III.	12	i. 15, ii. 641	— heraldica, ♂	V.	4	i. 49, ii. 6
— pacifica ‡, ♂	III.	10, 11	i. 16, ii. 641	— xenos, ♂	V.	8	i. 50, ii. 6
<i>Thyridia melantho</i> , ♂	I.	4	i. 17, ii. 642	— patilla §§, ♂	V.	6	i. 50, ii. 6
<i>Mechanitis lycidice</i> , ♂ ♀	I.	7, 8	i. 19, ii. 642	— leila, ♂	V.	7	i. 51, ii. 6
— isthmia §, ♂ ♀	I.	11, 12	i. 20, ii. 642	— hippocrenis, ♂	V.	5	i. 52, ii. 6
— doryssus, ♂ ♀	I.	9, 10	i. 21, ii. 642	— jucunda, ♀	II.	3	i. 53, ii. 6
—, var., ♂	IV.	2	i. 21, ii. 642	<i>Hypoleria libera</i> , ♂ ♀	IV.	12, 13	i. 54, ii. 6
— labotas, ♀	IV.	1	i. 21, ii. 642	— fumosa, ♀	IV.	14	i. 55, ii. 6
— macrinus, ♂ ♀	I.	5, 6	i. 22, ii. 643	— cassotis , ♀	V.	10	i. 54, ii. 6
<i>Ceratinia decumana</i> , ♂	IV.	3	i. 23, ii. 643	— rhene , ♂	II.	6	i. 56, ii. 6
— megalopolis , ♀	III.	8	i. 23	<i>Pseudoscada utilla</i> , ♂ ♀	V.	13, 14	i. 57, ii. 6
— cleis , ♀	III.	5	i. 23, ii. 643	<i>Hymenitis lyra</i> , ♂ ♀	V.	11, 12	i. 57, ii. 6
— leucania , ♂	III.	9	i. 25, ii. 643	— furina, ♂ ♀	IV.	15, 16	i. 58, ii. 6
— callispila , ♂	III.	6, 7	i. 25, ii. 643	— sosunga , ♂ ♀	V.	15-18	i. 59, ii. 6
<i>Napeogenes hemimelæna</i> , ♀	III.	3	i. 26	— zygia , ♂ ♀	V.	19, 20	i. 60, ii. 6
— tolosa, ♂	II.	1	i. 27, ii. 643	<i>Heterosais nephele</i> ¶¶, ♂	V.	9	i. 61, ii. 6
— amara ¶, ♂	III.	4	i. 27, ii. 644	— cadra , ♂	II.	5	i. 62, ii. 6
— pædaretus, ♂ ♀	IV.	4, 5	i. 28	SATYRINÆ.			
<i>Direenna euehytwa</i> , ♂ ♀	III.	16, 17	i. 30, ii. 644	<i>Cærois gertrudtus</i> , ♂	CVII.	1, 2	i. 62, ii. 6
<i>Callithomia hedila</i> **, ♀	III.	1	i. 32, ii. 644	<i>Callitæra menander</i> , ♀ ♂	VI.	1, 2	i. 63, ii. 6
— panamensis, ♂	II.	2	i. 32	<i>Hetæra macleannania</i> , ♂ ♀	VI.	3, 4	i. 64, ii. 6
<i>Epithomia callipero</i>	III.	14	i. 33	<i>Picrella rubecula</i> , ♀	VI.	10, 11	i. 67, ii. 6
<i>Hyposcada adelphina</i> , ♂	III.	13	i. 36, ii. 644	— incanescens, ♀	VI.	5, 6	i. 68, ii. 6

* *Tithorea irene* on the Plate.

† *Oleria xanthina* on the Plate.

‡ *Ithomia eurimedia* on the Plate.

§ *Mechanitis isthmicus* on the Plate.

|| Placed under the genus *Ithomia* on the Plate.

¶ *Napeogenes tolosa* on the Plate.

** *Callithomia hezia* on the Plate.

†† *Pteronymia tigranes* on the Plate.

‡‡ *Ithomia lycaste* on the Plate.

§§ *Ithomia cotytto* on the Plate.

||| *Ithomia pusio* on the Plate.

¶¶ *Ithomia nero* on the Plate.

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
<i>rella ocreata</i> , ♂ ♀	VI.	7-9	i. 68	<i>Oxeoschistus gigas</i> , ♀	X.	8, 9	i. 110
<i>cirrhæa multiades</i> , ♂	VII.	1, 2	i. 70	<i>Pronophila timanthes</i> , ♂	X.	6, 7	i. 111
— <i>tomasia</i> , ♂	VII.	3	i. 70, ii. 651	<i>Drucina championi</i> , ♂	CVII.	15, 16	i. 113, ii. 663
— <i>ptorocopa</i> , ♂ ♀	VII.	4-6	i. 71				
<i>euptychia metaleuca</i> , ♂	VIII.	1, 2	i. 75, ii. 652	MORPHINÆ.			
— <i>mollina</i> *, ♀	VIII.	13, 14	i. 76, ii. 652	<i>Morpho justitia</i> , ♂	XI.	1, 2	i. 115
— <i>fetna</i> , ♂	VIII.	15, 16	i. 77, ii. 652	— <i>granadensis</i> , ♂	XI.	3	i. 118
— <i>salvini</i> , ♀	VIII.	17	i. 78	— <i>octavia</i> , ♂	XI.	4, 5	i. 121, ii. 663
— <i>labe</i> , ♀	VIII.	3	i. 79, ii. 652				
— <i>cleophes</i> , ♀	CVII.	3, 4	ii. 653	BRASSOLINÆ.			
— <i>gulfare</i> , ♂	VIII.	11	i. 80	<i>Dynastor strix</i> ¶¶, ♀	XII.	3, 4	i. 123
— <i>squamistriga</i> †, ♂	VIII.	24	i. 80, ii. 654	<i>Brassolis isthmia</i> , ♂	XII.	5, 6	i. 125
— <i>similis</i> , ♂	VIII.	4	i. 81, ii. 654	— —, ♀	XII.	7, 8	i. 125
— <i>renata</i> , ♂	VIII.	5	i. 82, ii. 655	<i>Opsiphanes josephus</i> , ♂	XIII.	3, 4	i. 126
— <i>pellonia</i> , ♂	CVII.	5, 6	ii. 655	— <i>tamarindi</i> , ♂	XIII.	5, 6	i. 128, ii. 664
— <i>satyrina</i> , ♂	VIII.	23	i. 84, ii. 655	— <i>xanthicles</i> ***, ♂	XII.	1, 2	i. 130
— <i>polyphemus</i> ‡, ♂	VIII.	22	i. 85	— <i>staudingeri</i> , ♂	CVII.	17, 18	ii. 665
— <i>nebulosa</i> , ♀	VIII.	10	i. 86	<i>Caligo memnon</i> , ♂	XIV.	1, 4	i. 133, ii. 666
— <i>camerta</i> , ♂	VIII.	6, 7	i. 86, ii. 656	— <i>telamoni</i> , ♂	XIV.	2, 3	i. 134
— <i>phares</i> , ♀	VIII.	8, 9	i. 88	<i>Eryphanis wardi</i> , ♂	XIII.	1, 2	i. 137, ii. 666
— <i>sericella</i> , ♀	VIII.	20, 21	i. 89	— <i>bubocula</i> , ♂	XV.	1, 2	i. 138
— <i>glaucina</i> , ♂	VIII.	18, 19	i. 90	— —, ♀	XV.	3	i. 138
— <i>philodice</i> , ♂	IX.	15, 16	i. 90, ii. 656	<i>Narope testacea</i> , ♂	XV.	4, 5	i. 139
— <i>nelsoni</i> , ♂	CVII.	7, 8	i. 91, ii. 656	— —, ♀	XV.	6	i. 139
— <i>argentella</i> , ♂	VIII.	26	i. 91, ii. 656				
— <i>clinas</i> , ♂	CVII.	9, 10	ii. 656	ACREINÆ.			
— <i>rogersi</i> , ♂	IX.	13, 14	i. 92	<i>Actinote anteas</i> †††, ♂	XVI.	1	i. 141, ii. 666
— <i>pephredo</i> §, ♂	VIII.	12	i. 92, ii. 657	— <i>guatemalena</i> †††, ♀	XVI.	2	i. 141, ii. 667
— <i>pyracmon</i> , ♀	VIII.	27	i. 93, ii. 658	— <i>nox</i> †††, ♂	XVI.	3, 4	i. 142, ii. 667
— —, ♂	CVII.	11, 12	i. 93, ii. 658	— —, ♀	XVI.	5, 6	i. 142, ii. 667
— <i>hedemanni</i> ¶, ♀	VIII.	25	i. 93, ii. 658				
— — **, ♂	IX.	17, 18	i. 93, ii. 658	HELICONINÆ.			
<i>getis andromeda</i> ††, ♂	X.	1	i. 98, ii. 659	<i>Heliconius melicerta</i>	XVI.	12, 13	i. 144
<i>nanopoda euopis</i> , ♂	IX.	9, 10	i. 102	— <i>albucilla</i>	XVI.	7, 8	i. 144
— —, ♀	IX.	11, 12	i. 102	— —, var.	XVI.	9	i. 144
— <i>cinua</i> , ♂	CVII.	13, 14	ii. 660	— <i>jucundus</i>	XVII.	1, 2	i. 146
<i>aliodes pisonia</i> ‡‡, ♂	X.	4	i. 103, ii. 661	— — §§§	XVI.	10, 11	i. 146
— <i>napæa</i> , ♂	X.	2, 3	i. 104	— <i>octavia</i>	XVII.	9, 10	i. 148
— <i>hulda</i> , ♂	IX.	7, 8	i. 104, ii. 661	— <i>formosus</i>	XVII.	7, 8	i. 148
— <i>cremera</i> §§, ♀	IX.	3, 4	i. 105	— <i>clarescens</i>	XVII.	5, 6	i. 150
— <i>triaria</i> , ♂	IX.	5, 6	i. 105, ii. 662	— <i>fasciatus</i>	XVII.	3, 4	i. 150
<i>ocheilus patrobas</i> , ♂	X.	5	i. 106, ii. 662	— <i>montanus</i>	XVII.	11	i. 152, ii. 668
<i>oschistus hilarus</i> , ♂	X.	14, 15	i. 107, ii. 662				
— <i>cothon</i> , ♂	X.	10, 11	i. 108				
— <i>submaculatus</i> , ♂	X.	12, 13	i. 109				
— <i>rogersi</i> , ♀	IX.	1, 2	i. 110				

* *Euptychia westwoodi* on the Plate.† *Euptychia zabdi* on the Plate.‡ *Euptychia cyclops* on the Plate.§ *Euptychia gemma* on the Plate.|| *Euptychia hilaria* on the Plate.¶ *Euptychia ithamna* on the Plate.** *Euptychia vetones* on the Plate.†† *Tagetis sylvia* on the Plate.‡‡ *Pedaliodes dejectu* on the Plate.§§ *Pedaliodes cremona* on the Plate.||| *Oxeoschistus hilara* on the Plate.¶¶ *Brassolis strix* on the Plate.*** *Opsiphanes xanthus* on the Plate.††† *Acraea anteas* on the Plate.‡‡‡ *Acraea nox* on the Plate.§§§ *Heliconius xanthicus* on the Plate.

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
<i>Heliconius galanthus</i>	XVIII.	1, 2	i. 155, ii. 668	<i>Phyciodes nigrella</i> , ♂	XXI.	24, 25	
— <i>chioneus</i>	XVIII.	7, 8	i. 156	— —, ♀	XXI.	26	
— <i>leuce</i>	XVIII.	3, 4	i. 156	— <i>niveonotis</i> , ♂	XXI.	27	
— <i>sappho</i>	XVIII.	5, 6	i. 157	— <i>poltis</i> , ♂	XXI.	28, 29	
— <i>theudela</i>	XVIII.	9, 10	i. 157, ii. 669	— <i>sitalcos</i> , ♂	XXI.	30, 31	
— <i>pachinus</i>	XVIII.	11	i. 158	— <i>ptolyca</i> , ♂	XXI.	32, 33	i. 201, ii.
— <i>magdalena</i>	XVIII.	13	i. 159, ii. 669	— —, var. <i>lelex</i> , ♀	XXI.	34	
— <i>verapacis</i>	XVIII.	12	i. 159, ii. 669	— —, var. <i>alethes</i> , ♂	XXI.	35	
<i>Eucides vulgiformis</i>	XIX.	3	i. 162, ii. 669	— —, var. <i>stesilea</i> , ♀	XXI.	36	
— <i>lineata</i>	XIX.	2	i. 163, ii. 670	— <i>phlegias</i> , ♂	CVIII.	21, 22	
— <i>olympia</i>	XIX.	1	i. 164	— <i>tulcis</i> , ♂	XXII.	1, 2	i. 203, ii.
Nymphaliniæ.				— <i>frisias</i> , ♂	XXII.	6	
<i>Clothilda insignis</i> , ♀	XIX.	4, 5	i. 174	— <i>ardys</i> , ♂	XXII.	3, 4	i. 204, ii.
<i>Synchlœ lucinia</i> , ♂ ♀	XIX.	6-17	i. 176, ii. 671	— —, ♀	XXII.	5	i. 204, ii.
— <i>melanarge</i> , ♂	XX.	9, 10	i. 179, ii. 672	— <i>subota</i> , ♂	XXII.	7, 8	
— <i>erodyte</i> , ♀	XX.	3, 4	i. 180, ii. 672	— <i>drymæa</i> , ♂	XXII.	9, 10	
— <i>pœcile</i> , ♂	XX.	1, 2	i. 180, ii. 672	— <i>sisis</i> , ♂	XXII.	11, 12	
— <i>eumeda</i> , ♂	CVIII.	1, 2	ii. 672	— <i>nebulosa</i> , ♂	XXII.	13, 14	
— <i>dryope</i> , ♂	CVIII.	3, 4	ii. 672	— <i>alexon</i> , ♂	CVIII.	23, 24	
— <i>endeis</i> , ♂	CVIII.	5, 6	ii. 673	— —, ♀	CVIII.	25, 26	
— <i>hylæus</i> , ♂	CVIII.	7, 8	ii. 673	— <i>fulgora</i> , ♀	XXII.	15, 16	
— <i>gandalis</i> , ♂	XX.	5, 6	i. 182, ii. 673	— <i>erithona</i> , ♂	XXII.	17, 18	
— <i>bonplandi</i> *, ♀	XX.	7, 8	i. 182, ii. 673	— <i>atronia</i> , ♂	XXII.	19, 20	
<i>Eresia mechanitis</i> , ♀	XX.	13, 14	i. 183	— —, ♀	XXII.	21	
— <i>drypetis</i> , ♂	XX.	11, 12	i. 184	— <i>cassiopœa</i> , ♀	XXII.	22, 23	
— <i>nigripennis</i> , ♂	XX.	15, 16	i. 186	— <i>diallus</i> , ♀	XXII.	24, 25	
— <i>eutropia</i> †, ♀	XX.	17, 18	i. 187	— <i>fulviplaga</i> , ♀	XXII.	26, 27	
— —, ♂	XXI.	1	i. 187	— <i>otanes</i> , ♂	XXII.	28, 29	
— <i>cœla</i> , ♀	XXI.	2, 3	i. 187	— <i>cyno</i> , ♂	CVIII.	27, 28	
— <i>pœcilina</i> , ♀	XX.	19, 20	i. 188	— —, ♀	CVIII.	29, 30	
— <i>clara</i> , ♂ ♀	XX.	21, 22	i. 189, ii. 674	— <i>sopolis</i> , ♂	XXII.	30	
<i>Argynnis nitocris</i> , var. <i>cœrules-</i>	XXII.	15, 16	ii. 675	— —, ♀	XXII.	31, 32	
<i>cens</i> , ♂	XXII.	17, 18	ii. 675	<i>Microtia elva</i> , ♂	XX.	23	i. 210, ii.
— —, —, ♀	XXII.	9, 10	ii. 676	<i>Eurema arcæi</i> , ♂	XXIII.	1, 2	i. 214, ii.
<i>Melitæa beckeri</i> , ♂	CVIII.	11, 12	ii. 676	<i>Eunica mira</i> , ♀	XXIII.	10, 11	
— <i>schausi</i> , ♂	CVIII.	10, 11	i. 191, ii. 677	— <i>alemena</i> , ♀	XXIII.	6, 7	
<i>Phyciodes cyneas</i> , ♂	XXI.	12	i. 191	— <i>pomona</i> , ♂	XXIII.	8, 9	
— <i>cynisca</i> , ♂	XXI.	4, 5	i. 193, ii. 678	— <i>amata</i> , ♂	XXIV.	1, 2	
— <i>picta</i> , ♂	XXI.	13, 14	i. 194	— <i>augusta</i> , ♂	XXIII.	3, 4	i. 226, ii.
— <i>thebais</i> , ♂	XXI.	15	i. 194	— —, ♀	XXIII.	5	i. 226, ii.
— —, ♀	XXI.	16, 17	i. 194, ii. 678	— <i>excelsa</i> , ♂	XXIII.	12, 13	
— <i>boucaldi</i> , ♂	XXI.	18, 19	i. 195, ii. 678	— <i>modesta</i> , ♂	XXIII.	15, 16	i. 228, ii.
— <i>pallescentis</i> , ♂	XXI.	6, 7	i. 196, ii. 679	— <i>tatila</i> ‡, ♂	XXIII.	14	i. 229, ii.
— <i>elada</i> , ♂	XXI.	8, 9	i. 196, ii. 679	<i>Myscelia ethusa</i> (<i>rogenhoferi</i>), ♀	XXIV.	3, 4	i. 231, ii.
— <i>imitata</i> , ♀	XXI.	13, 14	ii. 679	<i>Epiphile grandis</i> , ♂	XXIV.	5, 6	
— <i>dymas</i> , ♂	CVIII.	15, 16	ii. 679	— —, ♀	XXIV.	7	
— <i>hepburni</i> , ♂	CVIII.	17, 18	ii. 679	— <i>plutonia</i> , ♂	XXIV.	8, 9	
— <i>anomalus</i>	CVIII.	20	i. 197	— —, ♀	XXIV.	10	
— <i>anicta</i> , ♂	XXI.	21, 22	i. 198	<i>Bolboneura sylphis</i> , ♂	XXIV.	11, 12	i. 237, ii.
— <i>cluvia</i> , ♂	XXI.	19, 20	ii. 680	<i>Epicalia chromis</i> , ♂	XXIV a.	1	i. 243, ii.
— <i>faustus</i>	CVIII.	23	i. 198, ii. 680	— —, ♀	XXIV a.	2	i. 243, ii.
— <i>fragilis</i> , ♂	XXI.			— <i>aglaure</i> , ♂	XXIV.	13, 14	i. 244, ii.
				— —, ♀	XXIV.	15	i. 244, ii.
				<i>Euhagis thescus</i> , ♂	XXIV a.	7, 8	i. 246, ii.

* *Synchlœ narva* on the Plate.† *Eresia dismorphina* on the Plate.‡ *Eunica cœrula* on the Plate.

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
<i>pagis anubis</i> , ♂	XXIV a.	9	i. 247	<i>Adelpha lerna</i> , ♂	XXIX.	12, 13	i. 304
— <i>ate</i> , ♂	XXIV a.	5, 6	i. 247	— <i>phylaea</i> , ♀	XXX.	1, 2	i. 304
— <i>sosthenes</i> , ♂	XXIV a.	17, 18	i. 248	— <i>pithys</i> , ♂	XXVIII.	7, 8	i. 305, ii. 692
— —, ♀	XXIV a.	19	i. 248	— <i>basilea</i> **, ♂	XXVIII.	9, 10	i. 306, ii. 692
— <i>chryseis</i> , ♂	XXIV a.	15, 16	i. 248	— <i>iphicla</i> ††, ♂	XXVIII.	11, 12	i. 306, ii. 692
— <i>salpensa</i> , ♂	XXIV a.	13, 14	i. 248	— <i>basiloides</i> , ♀	XXVIII.	15, 16	i. 307, ii. 692
— <i>thalassina</i> , ♂	XXIV a.	10, 11	i. 249	— <i>felderi</i> ††, ♂	XXVIII.	13, 14	i. 307
— —, ♀	XXIV a.	12	i. 249	— <i>sentia</i> , ♂	XXIX.	9, 10	i. 309
— <i>glance</i> , ♂	XXIV a.	20, 21	i. 251, ii. 687	— <i>pione</i> , ♀	XXIX.	16, 17	i. 309
— —, ♀	XXIV a.	22	i. 251, ii. 687	— <i>massilia</i> , ♂	XXIX.	7, 8	i. 309
— <i>logramma bacehis</i> , ♂	XXIV a.	3, 4	i. 253, ii. 687	— <i>paraeca</i> , ♀	XXVIII.	5, 6	i. 310
— <i>licore astala</i> , ♀	XXV.	5, 6	i. 254, ii. 687	<i>Chlorippe callianira</i> §§, ♂	XXX.	9	i. 314, ii. 693
— <i>asteria</i> , ♂	CVIII.	31, 32	ii. 687	— —, ♀	XXX.	10, 11	i. 314, ii. 693
— <i>eupepla</i> , ♂	XXV.	3, 4	i. 256	— <i>cyane</i> §§, ♀	XXXI.	1, 2	i. 317
— <i>beleses</i>	CVIII.	33, 34	ii. 688	— <i>cherubina</i> §§, ♀	XXXI.	3, 4	i. 318, ii. 693
— <i>neglecta</i> , ♂	XXV.	1, 2	i. 256	<i>Doxocopa argus</i> §§, ♂	XXX.	12, 13	i. 319, ii. 693
— <i>agramma faustina</i> , ♂	XXV.	7, 8	i. 258	— —, ♀	XXX.	14	i. 319, ii. 693
— <i>tolima</i> , ♂	XXV.	19	i. 260	<i>Prepona camilla</i> , ♂	XXXI.	9, 10	i. 321
— <i>denina</i> *, ♂	XXV.	17, 18	i. 260, ii. 688	— <i>ælia</i> , ♂	CIX.	3	ii. 694
— <i>pacifica</i> , ♂	XXV.	15, 16	i. 261	— <i>gnorima</i> , ♂	XXXI.	7, 8	i. 323, ii. 695
— <i>titania</i> , ♂	XXV.	11, 12	i. 261, ii. 688	— <i>brooksiana</i> , ♀	CIX.	4, 5	ii. 695
— —, ♀	XXV.	13, 14	i. 261, ii. 688	<i>Agrias ædon</i> , ♀	XXXI.	5, 6	i. 328, ii. 696
— <i>casta</i> , ♂	XXV.	9, 10	i. 262	<i>Siderone ido</i> , var. <i>thebais</i> , ♂	XXXVII.	8, 9	i. 333, ii. 696
— <i>geronia glauconome</i> , ♂	XXVI.	9, 10	i. 268, ii. 689	— —, ♀	XXXVII.	10	i. 333, ii. 696
— <i>atlantis</i> , ♂	XXVI.	5, 6	i. 269, ii. 689	<i>Anæa titan</i> , ♀	CIX.	6, 7	i. 337, ii. 696
— —, ♀	XXVI.	7, 8	i. 269, ii. 689	— <i>nobilis</i> , ♂	XXXV.	1, 2	i. 340
— <i>idromia arienis</i> †, ♂	XXVI.	11, 12	i. 272	— —, ♀	XXXV.	3	i. 340
— <i>guatemalena</i> ‡, ♂	XXVI.	1, 2	i. 273, ii. 690	— <i>morta</i> , ♀	XXXII.	11, 12	i. 340, ii. 697
— <i>iphithime</i> §, ♂	XXVI.	3, 4	i. 274	— —, ♂	XXXIV.	5, 6	i. 340, ii. 697
— <i>phirene superba</i> , ♂	XXVII.	1, 2	i. 282	— <i>indigotica</i> , ♂	XXXIII.	1, 2	i. 342
— <i>aetes corita</i> , ♂	XXVII.	7, 8	i. 285	— — ¶¶, ♀	XXXIII.	3, 4	i. 342
— —, ♀	XXVII.	9, 10	i. 285	— <i>xenica</i> , ♀	XXXIII.	5, 6	i. 343
— <i>phiale</i> , ♀	XXVII.	11	i. 286	— <i>promenæa</i> , ♂	XXXIV.	1, 2	i. 343
— <i>pyrrhogyra hypsenor</i> , ♂	XXVII.	3, 4	i. 292, ii. 691	— <i>beatrice</i> , ♂	XXXII.	9, 10	i. 343
— <i>otolais</i> , ♂	XXVII.	5, 6	i. 293	— —, ♀	XXXVI.	9, 10	i. 343
— <i>delpha melanthe</i> , ♂	XXVIII.	1, 2	i. 296	— <i>schausiana</i> , ♂	CIX.	8	ii. 697
— <i>demialba</i> , ♂	XXX.	5, 6	i. 297	— —, ♀	CIX.	9, 10	ii. 697
— <i>sophax</i> , ♂	XXIX.	1, 2	i. 297	— <i>perenna</i> ***, ♂	XXXII.	3, 4	i. 344
— <i>tizona</i> , ♂	XXIX.	11	i. 298	— <i>onophis</i> , ♂	XXXII.	1, 2	i. 344
— <i>salmonens</i> , ♂	XXVIII.	3, 4	i. 298	— —, ♀	XXXIV.	11, 12	i. 344
— <i>leuceria</i> ¶, ♀	XXX.	7, 8	i. 300, ii. 691	— <i>pithyusa</i> , ♂	XXXII.	7, 8	i. 345, ii. 697
— <i>fessonia</i> , ♀	XXIX.	18, 19	i. 301, ii. 691	— <i>xenoeles</i> , ♂	XXXII.	5, 6	i. 346, ii. 697
— <i>erotia</i> , ♂	XXIX.	14, 15	i. 301	— <i>proserpina</i> , ♂	XXXIII.	7, 8	i. 348, ii. 698
— <i>erymanthis</i> , ♀	XXIX.	5, 6	i. 302	— —, ♀	XXXIII.	9, 10	i. 348, ii. 698
— <i>oberthürri</i> , ♂	XXIX.	3, 4	i. 302, ii. 691	— <i>laura</i> , ♂	XXXVII.	4, 5	i. 348, ii. 698
— <i>diocles</i> , ♂	XXX.	3, 4	i. 303	— <i>ambrosia</i> , ♀	XXXVI.	11, 12	i. 349
— <i>creton</i> , ♀	CIX.	1, 2	ii. 692	— —, ♂	XXXVII.	6, 7	i. 349

* *Cutagramma guatemalena* on the Plate.† *Ageronia arinome* on the Plate.‡ *Ageronia guatemalena* on the Plate.§ *Ageronia iphithime* on the Plate.|| *Pyrrhogyra tipha* on the Plate.¶ *Adelpha leucernia* on the Plate.** *Adelpha epiphida* on the Plate.†† *Adelpha iphicleola* on the Plate.‡‡ *Adelpha falcata* on the Plate.§§ Placed under the genus *Apatura* on the Plate.||| *Prepona demophon* on the Plate.¶¶ *Anæa zelica* on the Plate.*** *Anæa amenophis* on the Plate.

LIST OF PLATES.

XXXV

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
<i>Anæa clara</i> , ♂	CIX.	11, 12	ii. 698	<i>Mesosemia hesperina</i> , ♂ ♀	XXXVIII.	13, 14	
— <i>anassa</i> , ♂	XXXVI.	1, 2	i. 349	— <i>carissima</i> , ♂ ♀	XXXVIII.	8, 9	
— —, ♀	XXXVI.	3, 4	i. 349	— <i>gaudiolum</i> , ♂	XXXVIII.	5	
— <i>forreri</i> , ♂	XXXIV.	3, 4	i. 350, ii. 698	— —, ♀	XLIII.	1	
— <i>orthesia</i> , ♂	XXXVI.	5, 6	i. 351, ii. 698	— <i>grandis</i> , ♂ ♀	XXXVIII.	6, 7	
— —, ♀	XXXVI.	7, 8	i. 351, ii. 698	— <i>cœlestis</i> , ♀	XXXVIII.	16	
— <i>dia</i> , ♂	XXXIV.	7, 8	i. 351	— <i>asa</i> , ♂ ♀	XXXVIII.	10, 11	
— <i>aurcola</i> , ♂	XXXVII.	1, 2	i. 351	— <i>cecropia</i> , ♂	XXXVIII.	12	
— —, ♀	XXXVII.	3	i. 351	— <i>zonalis</i> , ♀	XXXVIII.	15	
— <i>jansoni</i> , ♀	XXXV.	4, 5	i. 353	— —, ♂	XLIII.	2	
— <i>excellens</i> , ♂	XXXV.	6, 7	i. 353	— <i>vestalis</i> , ♀	XXXVIII.	17	
— <i>callidryas</i> , ♀	XXXV.	8, 9	i. 354	— <i>lepida</i> , ♀	XLIII.	3	
— <i>opalina</i> *, ♂	XXXIV.	9, 10	i. 354	— <i>nivalis</i> , ♀	XLIII.	4	i. 386, i
ERYCINIDÆ.				<i>Cremna eucharila</i> , ♂ ♀	XXXVIII.	18, 19	
NEMEOBIINÆ.				<i>Lyropteryx cleadas</i> , ♂	XLI.	9, 10	
<i>Eurygona aurantiaca</i> , ♂	XXXIX.	1, 2	i. 364	— —, ♀	XLI.	11, 12	
— —, ♀	XLIII.	9, 10	i. 364	<i>Necyria larunda</i> , ♂	XLIII.	11, 12	
— <i>cheles</i> , ♀	CX.	1, 2	ii. 699	<i>Cyrenia pyrippe</i> , ♂	XLI.	13, 14	
— <i>gyda</i> †, ♀	XXXIX.	3, 4	i. 364	<i>Ithomeis imitatrix</i> , ♂	XLI.	15, 16	
— <i>crotopus</i> , ♀	XL.	7, 8	i. 365	— —, ♀	XLI.	17	
— <i>procula</i> , ♂	XXXIX.	15, 16	i. 365	<i>Tmetoglene dinora</i> , ♂	XLII.	1	
— —, ♀	XXXIX.	17, 18	i. 365	— <i>dodone</i> , ♂	XLII.	2, 3	
— <i>athena</i> , ♂	XXXIX.	21, 22	i. 365	— —, ♀	XLII.	4	
— <i>amphidecta</i> , ♂	XL.	5, 6	i. 366	<i>Lepricornis bicolor</i> , ♀	XLIII.	13	
— <i>eubule</i> , ♂	XL.	13, 14	i. 366, ii. 699	— <i>unicolor</i> ‡, ♂	XLVII.	6	i. 487, i
— —, ♀	XL.	15	i. 366, ii. 699	<i>Chamælimnas villagomes</i> ♀	XLI.	8	
— <i>hypophæa</i> , ♂	XL.	9, 10	i. 367	<i>Chimastrum argenteum</i> §, ♂	XLII.	28	
— <i>leucorrhœa</i> , ♂	XL.	11, 12	i. 367	<i>Limnas gynæceas</i> , ♀	CX.	3	
— <i>sergia</i> , ♂	XXXIX.	9, 10	i. 367, ii. 699	<i>Esthemopsis alicia</i> , ♂	XLI.	18, 19	
— —, ♀	XXXIX.	11, 12	i. 367, ii. 699	— (?) <i>cæruleata</i> , ♂	XLI.	6, 7	
— <i>hieronymi</i> , ♂	XXXIX.	13, 14	i. 368, ii. 700	— (?) <i>radiata</i> , ♀	XLII.	5	
— <i>inconspicua</i> , ♀	XXXIX.	19, 20	i. 368, ii. 700	<i>Mesenopsis melanochlora</i> , ♂	XLI.	5	
— <i>pusilla</i> , ♀	XL.	16, 17	i. 369, ii. 700	<i>Symmachia rubina</i> , ♂	XLII.	12	i. 419, i
— <i>regipennis</i> , ♂	XL.	1, 2	i. 369	<i>Mesene ignicauda</i> , ♂	XLII.	19, 20	
— —, ♀	XL.	3, 4	i. 369	— —, ♀	XLII.	21	
— <i>eupepla</i> , ♂	XLIII.	5, 6	i. 369	— <i>rubella</i> , ♂	XLII.	22	
— —, ♀	XLIII.	7, 8	i. 369	— —, ♀	XLII.	23, 24	
— <i>bettina</i> , ♂	XL.	23, 24	i. 370	— <i>crocella</i> , ♂	XLII.	25, 26	i. 423, i
— <i>cataleuca</i> , ♂	XL.	21, 22	i. 370, ii. 700	— —, ♀	XLII.	27	i. 423, i
— <i>aurantia</i> , ♂	XL.	18, 19	i. 370	— <i>silaris</i> , ♂	XLII.	29	
— —, ♀	XL.	20	i. 370	<i>Pachythone gigas</i> , ♀	XLIV.	25	
— <i>chrysippe</i> , ♂	XXXIX.	5, 6	i. 371	<i>Charis cadmeis</i> , ♂	XLIV.	1, 2	
— —, ♀	XXXIX.	7, 8	i. 371	— <i>velutina</i> , ♂	XLIV.	3, 4	i. 428, i
<i>Methonella chrysomela</i> , ♂	XLI.	1, 2	i. 372	— <i>argyrodonis</i> , ♂	XLIV.	5, 6	
— —, ♀	XLI.	3, 4	i. 372	— <i>crocea</i> , ♂	XLVII.	3, 4	
ERYCININÆ.				— —, ♀	XLVII.	5	
<i>Eurybia patrona</i> , ♂	XXXVIII.	1, 2	i. 375, ii. 700	— <i>holosticta</i> , ♂	XLIV.	7	i. 431, i
<i>Mesosemia telegone</i> , ♂ ♀	XXXVIII.	3, 4	i. 379	— <i>macularia</i> ¶, ♂	XLIV.	8	
				— <i>sulphurea</i> , ♀	CX.	4	i. 432, i
				— <i>pœcilopectera</i> , ♂	XLIV.	23, 24	
				<i>Calydna venusta</i> , ♂	XLVII.	1, 2	i. 433, i
				<i>Sarota psaros</i> **, ♀	XLIII.	14, 15	

* *Anæa callidryas* on the Plate.† *Eurygona russata* on the Plate.‡ *Esthemopsis* (?) *unicolor* on the Plate.§ *Mesene argentea* on the Plate.|| *Limnas melanochlora* on the Plate.¶ *Charis ochrias* on the Plate.** *Anteros psaros* on the Plate.

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
<i>ros renaldus</i> , ♂	XLII.	6, 7	i. 440	<i>Nymphidium hæmatostictum</i> , ♂	XLVI.	1, 2	i. 474
<i>sis æthalia</i> , ♂	XLII.	16, 17	i. 442	— <i>sicyon</i> , ♂	XLVI.	4	i. 475, ii. 710
—, ♀	XLII.	18	i. 442	— <i>ipsea</i> , ♀	XLV.	17, 18	i. 476
<i>tenedia</i> , ♂	XLIII.	16, 17	i. 443, ii. 704	— <i>ictericum</i> , ♂	XLVI.	3	i. 476
—, ♀	XLIII.	18	i. 443, ii. 704	— <i>nycteus</i> , ♀	XLVII.	18	i. 476
— (<i>lupina</i>), ♂	XLII.	13, 14	i. 444, ii. 704	— <i>velabrum</i> , ♀	XLV.	19, 20	i. 477
— (—), ♀	XLII.	15	i. 444, ii. 704	<i>Pandemos nymphidioides</i> , ♂	XLVI.	5, 6	i. 479
<i>brimo</i> , ♂	CX.	5, 6	ii. 704	<i>Theope eudocia</i> , ♂	XLVI.	10, 11	i. 481
<i>pæas</i> , ♂	CX.	7, 8	ii. 704	—, ♀	XLVI.	12	i. 481
—, ♀	CX.	9, 10	ii. 704	— <i>hypoxanthe</i> , ♂	XLVII.	21, 22	i. 482, ii. 710
<i>liodes</i> , ♂	XLIII.	19	i. 447, ii. 705	— (—) (<i>isia</i>), ♂	XLVI.	20, 21	i. 482, ii. 710
—, ♀	XLIII.	20, 21	i. 447, ii. 705	— <i>barea</i> , ♂	XLVI.	13, 14	i. 482
<i>lampeto</i> *, ♂	XLII.	8, 9	i. 448	—, ♀	XLVI.	15	i. 482
<i>ino</i> *, ♂	XLIII.	22, 23	i. 449, ii. 705	— <i>theutis</i> ¶, ♀	XLVI.	{ 16, 17 ** }	i. 483
—, ♀	XLIII.	24, 25	i. 449, ii. 705	— <i>folia</i> , ♂	XLVII.	23, 24	i. 483
<i>rhacotis</i> *, ♀	XLII.	10, 11	i. 449, ii. 706	— <i>herta</i> , ♂	XLVII.	25, 26	i. 483
<i>harmonia</i> *, ♂	XLIII.	{ 26, 27 † }	i. 449	— <i>virgilius</i> , ♂	XLVI.	7, 8	i. 484, ii. 711
<i>tis nesæa</i> , ♂	CX.	11, 12	ii. 706	— <i>talna</i> , ♀	CX.	23, 24	ii. 711
<i>acharis victrix</i> ‡, ♂	XLIV.	9, 10	i. 454	— <i>diores</i> , ♂	CX.	25, 26	ii. 711
—, ♀	XLIV.	11, 12	i. 454	—, ♀	CX.	27, 28	ii. 711
<i>ops purpurata</i> , ♂	XLIV.	15, 16	i. 456	— <i>cratylus</i> , ♂	XLVI.	9	i. 484
<i>isthmica</i> , ♂	XLIV.	13, 14	i. 457	— <i>publius</i> , ♂	XLVII.	19, 20	i. 484
<i>trötschi</i> , ♀	CX.	13, 14	ii. 707	— <i>eleutho</i> , ♀	CX.	29, 30	ii. 712
<i>onias adelina</i> , ♂	XLVII.	9, 10	i. 459	— <i>mania</i> , ♀	CX.	31, 32	ii. 712
<i>lilina</i> , ♂	XLIV.	21	i. 459, ii. 708	— <i>basilea</i> , ♂	XLVI.	22, 23	i. 485
<i>idmon</i> , ♂	CX.	15, 16	ii. 708	—, ♀	XLVI.	24, 25	i. 485
—, ♀	CX.	17, 18	ii. 708	— <i>decorata</i> , ♀	XLVI.	18, 19	i. 485
<i>densemaculata</i> , ♂	XLIV.	19	i. 460	— <i>matuta</i> , ♀	CX.	33, 34	ii. 712
<i>eudocia</i>	CX.	19, 20	ii. 708				
<i>glauca</i>	XLIV.	20	i. 460				
<i>theages</i> , ♀	XLIV.	22	i. 460				
<i>pelarge</i> , ♂	XLIV.	17, 18	i. 461, ii. 708				
<i>agave</i> , ♂	XLVII.	7, 8	i. 462				
<i>zeurippa</i> , ♂	XLV.	4, 5	i. 462, ii. 709				
—, ♀	CX.	21, 22	ii. 709				
<i>lasthenes</i> , ♂	XLV.	1, 2	i. 463				
—, ♀	XLV.	3	i. 463				
<i>labotas</i> , ♂	XLV.	8, 9	i. 464				
<i>earis erostratus</i> §, ♂	XLV.	6, 7	i. 465				
<i>domina</i> §, ♂	XLV.	10, 11	i. 465				
—, ♀	XLV.	12	i. 465				
<i>lemia hypoglaucia</i> §, ♀	XLV.	13, 14	i. 468, ii. 709				
<i>hepburni</i> §, ♂	XLVII.	11, 12	i. 468				
<i>walkeri</i> §, ♂	XLVII.	13, 14	i. 468, ii. 709				
<i>phidium præclarum</i> , ♀	XLV.	15	i. 471				
<i>labdacus</i> , ♀	XLVII.	17	i. 471, ii. 709				
<i>latus</i> , ♂	XLVII.	15, 16	i. 472				
<i>dorilis</i> , ♂	XLV.	16	i. 472				

* Placed under the genus *Symmachia* on the Plate.

† Wrongly numbered 25, 26 at the bottom of the plate and in the text.

‡ *Metacharis nigrella* on the Plate.

§ Placed under the genus *Lemonias* on the Plate.

|| *Theope baria* on the Plate.

¶ *Theope thoots on the Plate.*

** Wrongly marked 16 ♂, 17 ♀ at the bottom of the Plate.

LIST OF PLATES.

xxxvii

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
<i>Thecla angustula</i> , ♂	L.	21, 22	ii. 16, 713	<i>Thecla jada</i> , ♂	LII.	13, 14	ii. 3
— <i>nepia</i> , ♂	L.	19, 20	ii. 16, 713	— <i>janias</i> , ♂	LII.	15	ii. 3
— <i>hisbon</i> , ♂	XLIX.	4, 5	ii. 17	— <i>talayra</i> , ♂	LII.	16, 17	ii. 3
— —, ♀	XLIX.	6	ii. 17	— <i>atesa</i> , ♂	LII.	18, 19	
— <i>hemon</i> , ♂	XLIX.	7, 8	ii. 17, 714	— <i>hypsea</i> , ♂	LII.	20, 21	
— <i>gaumeri</i> , ♂	CXI.	1, 2	ii. 714	— <i>janthina</i> , ♂	LII.	22, 23	
— <i>cynara</i> , ♂	XLIX.	9, 10	ii. 19	— <i>orgia</i> , ♂	LII.	24, 25	
— —, ♀	XLIX.	11	ii. 19	— —, ♀	LII.	26	
— <i>polybe</i> , ♂	XLIX.	12, 13	ii. 19, 714	— <i>epytus</i> , ♂	LII.	27, 28	
— <i>inachus</i> , ♂	XLIX.	14, 15	ii. 20	— —, ♀	LII.	29	
— —, ♀	XLIX.	16	ii. 20	— <i>ortygus</i> , ♂	LIII.	1, 2	ii. 4
— <i>carpophora</i> , ♀	XLIX.	17	ii. 20, 714	— <i>phoenissa</i> , ♂	LIII.	3, 4	
— <i>carpasia</i> , ♂	XLIX.	18, 19	ii. 21, 714	— <i>jebus</i> , ♂	LIII.	5, 6	ii. 4
— <i>bacis</i> , ♂	XLIX.	20, 21	ii. 21	— —, ♀	LIII.	7	ii. 4
— —, ♀	XLIX.	22	ii. 21	— <i>brescia</i> , ♂	LIII.	8, 9	ii. 4
— <i>atys</i> , ♂	XLIX.	23	ii. 21	— —, ♀	LIII.	10	ii. 4
— <i>aufidena</i> , ♂	L.	1, 2	ii. 22, 714	— <i>orses</i> , ♂	LIII.	11, 12	
— —, ♀	L.	3	ii. 22, 714	— <i>vibidia</i> , ♂	LIII.	13, 14	
— <i>phaleros</i> , ♂	L.	4, 5	ii. 22	— <i>ligurina</i> , ♂	LIII.	15, 16	ii. 4
— —, ♀	L.	6	ii. 22	— <i>lyde</i> , ♂	LIII.	17	ii. 4
— <i>coccineifrons</i> , ♂	L.	7, 8	ii. 23	— <i>azurina</i> , ♂	LIII.	18, 19	
— —, ♀	L.	9	ii. 23	— <i>mycon</i> , ♂	LIII.	20, 21	ii. 4
— <i>carthæa</i> , ♂	L.	10, 11	ii. 24	— —, ♀	LIII.	22	ii. 4
— —, ♀	L.	12	ii. 24	— <i>erema</i> , ♂	LIII.	23, 24	
— <i>caranus</i> , ♂	L.	13, 14	ii. 24	— <i>primno</i> , ♀	LIII.	25, 26	
— —, ♀	L.	15	ii. 24	— <i>phobe</i> , ♂	LIII.	27, 28	ii. 4
— <i>neora</i> , ♂	L.	16, 17	ii. 24	— —, ♀	LIII.	29	ii. 4
— —, ♀	L.	18	ii. 24	— <i>terentia</i> , ♂	LIV.	1, 2	
— <i>oceia</i> , ♀	L.	23	ii. 25	— <i>rhodope</i> , ♂	LIV.	3, 4	
— —, ♂	L.	24, 25	ii. 25	— <i>spinetorum</i> , ♂	CXI.	5, 6	
— <i>laothoë</i> , ♂	L.	26, 27	ii. 25	— <i>ocrisia</i> , ♂	LIV.	5, 6	ii. 4
— <i>erybathis</i> , ♂	L.	28, 29	ii. 26	— <i>arpoxais</i> , ♂	LV.	25, 26	
— —, ♀	CXI.	3, 4	ii. 715	— <i>keila</i> , ♂	LIV.	7, 8	ii. 5
— <i>busa</i> , ♂	LI.	1, 2	ii. 26, 715	— —, ♀	LIV.	9	ii. 5
— <i>perpenna</i> , ♂	LI.	3, 4	ii. 27	— <i>orios</i> , ♂	LIV.	10, 11	
— <i>hyas</i> , ♀	LI.	5	ii. 27	— <i>praxis</i> , ♂	LIV.	12, 13	
— —, ♂	LI.	6, 7	ii. 27	— <i>ortalus</i> , ♂	LIV.	14, 15	
— <i>cadmus</i> , ♂	LI.	8, 9	ii. 27	— <i>cambes</i> , ♂	LIV.	16, 17	
— —, ♀	LI.	10	ii. 27	— —, ♀	LIV.	18	
— <i>petelina</i> , ♀	LI.	11, 12	ii. 28	— <i>volupia</i> , ♂	LIV.	19, 20	ii. 5
— <i>furina</i> , ♂	LI.	13, 14	ii. 28, 715	— <i>epidius</i> , ♂	LIV.	21, 22	
— <i>cyda</i> , ♀	LI.	15, 16	ii. 28	— <i>lausus</i> , ♀	LIV.	23	
— <i>parthenia</i> , ♂	LI.	17, 18	ii. 29, 715	— <i>ochus</i> , ♂	LIV.	24, 25	ii. 5
— <i>theia</i> , ♂	LI.	19, 20	ii. 29	— —, ♀	LIV.	26, 27	ii. 5
— —, ♀	LI.	21	ii. 29	— <i>pion</i> , ♂	LIV.	28, 29	ii. 5
— <i>barajo</i> , ♂	LI.	22, 23	ii. 30, 715	— —, ♀	LIV.	30	ii. 5
— —, ♀	LI.	24	ii. 30, 715	— <i>oppia</i> , ♂	LV.	1, 2	
— <i>eunus</i> , ♂	LI.	25, 26	ii. 30	— <i>ambrax</i> , ♂	LV.	5, 6	
— <i>phæa</i> , ♂	LI.	27, 28	ii. 32	— <i>syedra</i> , ♂	LV.	7, 8	
— —, ♀	LI.	29	ii. 32	— <i>ericeta</i> , ♂	LV.	3, 4	
— <i>togarna</i> , ♂	LII.	1, 2	ii. 32, 716	— <i>latagus</i> , ♂	LV.	9, 10	
— <i>herodotus</i> , ♂	LII.	3, 4	ii. 33, 716	— <i>oratus</i> , ♂	LV.	11, 12	ii. 5
— —, ♀	LII.	5	ii. 33, 716	— <i>gadira</i> , ♂	LV.	13, 14	
— <i>fusus</i> , ♂	LII.	6, 7	ii. 34, 716	— <i>norax</i> , ♂	LV.	17, 18	
— <i>pastor</i> , ♂	LII.	8, 9	ii. 34, 716	— <i>minthe</i> , ♂	LV.	15, 16	
— —, ♀	LII.	10	ii. 34, 716	— <i>aura</i> , ♂	LV.	21, 22	
— <i>agricolor</i> , ♂	LII.	11, 12	ii. 34	— <i>attalion</i> , ♂	LV.	19, 20	

[illegible]

* *Thecla nicæ* on the Plate.

† *Thecla hecale* on the Plate.

‡ *Euterpe zenobina* on the Plate.

§ Placed under the genus *Euterpe* on the Plate.

|| *Euterpe diamorphitis* on the Plate.

• *Pieris alethina* on the Plate.

** Incorrectly written *Daptonura* on the Plate.

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
<i>Terias athalia</i> , ♂	LXIII.	9, 10	ii. 164	<i>Papilio copanæ</i> , ♀	LXVI.	4	ii.
—, ♀	LXIII.	11, 12	ii. 164	—, ♂	LXVI.	5, 6	ii.
— <i>limbia</i> , ♂	LXIII.	13, 14	ii. 164	— <i>iopas</i> , ♂	CXI.	9, 10	ii.
—, ♀	LXIII.	15	ii. 164	— <i>eracón</i> , ♂	CXI.	11, 12	ii.
— <i>mana</i> , ♂	LXIV.	13, 14	ii. 167	— <i>procas</i> , ♂	LXV.	15, 16	ii.
— <i>jucunda</i> , ♂	LXIV.	9, 10	ii. 168	— <i>philenor</i> , ♂ (genitalia &c.)	LXV.	18, 18 a	ii.
—, ♀	LXIV.	11, 12	ii. 168	— <i>corbis</i> , ♂	LXVI.	7, 8	ii.
— <i>cepio</i> , ♂	LXIV.	5, 6	ii. 169	— <i>orsua</i> , ♂	LXVI.	9, 10	ii.
—, ♀	LXIV.	7, 8	ii. 169	— <i>thymbræus</i> , ♂ (genitalia)	LXVII.	2	ii.
— <i>sidonia</i> , ♂	LXIII.	16, 17	ii. 169	— <i>branchus</i> , ♂ (genitalia)	LXVII.	7	ii.
—, ♀	LXIII.	18, 19	ii. 169	— <i>belesis</i> , ♂	LXVII.	3, 4, 5	ii. 207
— <i>persistens</i> , ♂	LXIII.	24, 25	ii. 170	— <i>belephantes</i> , ♂	LXVII.	6	ii.
—, ♀	LXIII.	26, 27	ii. 170	— <i>guaco</i> , ♂	LXVII.	1	ii.
— <i>lydia</i> , ♂	LXIII.	20, 21	ii. 170	— <i>eridamas</i> , ♂	LXVII.	10	ii.
—, ♀	LXIII.	22, 23	ii. 170	— <i>phaon</i> , ♂ (genitalia)	LXVII.	9	ii.
— <i>vitellina</i> , ♂	LXIV.	1, 2	ii. 171	— <i>pharax</i> , ♂	LXVII.	8	ii. 211
—, ♀	LXIV.	3, 4	ii. 171	— <i>metaphaon</i> , ♂	CXI.	13, 14	ii. 212
<i>Nathalis iole</i> , ♂	LXIV.	15, 16	ii. 172	— <i>protesilaus</i> , ♂ (genitalia)	LXVIII.	6	ii.
—, ♀	LXIV.	17, 18	ii. 172	— <i>penthesisilaus</i> , ♂ (genitalia)	LXVIII.	7	ii.
<i>Dismorphia pallidula</i> *, ♂	LX.	9, 10	ii. 176	— <i>orabilis</i> , ♂	LXVII.	14, 15	ii.
—, ♀	LX.	11	ii. 176	— <i>lacandones</i> , ♂	LXVII.	11-13	ii.
— <i>fortunata</i> *, ♂	LXI.	1, 2	ii. 177	— <i>salvini</i> , ♂	LXVIII.	3, 4	ii.
—, ♀	LXI.	3	ii. 177	— <i>calliste</i> , ♂	LXVIII.	1, 2	ii.
— <i>ribbei</i> *, ♀	LXI.	4	ii. 178	— <i>marchandi</i> , ♂ (genitalia)	LXVIII.	5	ii.
<i>Acmepteron cinerascens</i> *, ♂	LX.	8	ii. 180	— <i>neosilaus</i> , ♂	LXVIII.	8, 9	ii.
— <i>lala</i> †, ♂	LXIV.	25, 26	ii. 181	— <i>philolans</i> , ♂ (genitalia)	LXVIII.	12	ii.
<i>Enantia jethys</i> *, ♂	LXI.	5, 6	ii. 182	— <i>xanticles</i> , ♀ ♂	LXVIII.	10, 11	ii.
— <i>albania</i> , ♂	LXIV.	27, 28	ii. 183, 727	— <i>epidaus</i> , ♂ (genitalia)	LXVIII.	15	ii.
— ‡, ♀	LXI.	7	ii. 183, 727	— <i>fenochionis</i> , ♂	LXVIII.	13, 14	ii. 222
— <i>mercenaria</i> *, ♂	LXI.	8, 9	ii. 183	— <i>thoas</i> , ♂ (genitalia)	LXIX.	4	ii. 223
— <i>virgo</i> *, ♂	LX.	14, 15	ii. 184	— <i>epidaurus</i> , ♂ (genitalia)	LXIX.	3	ii. 224
—, ♀	LX.	16	ii. 184	—, ♀	LXIX.	1, 2	ii. 224
— <i>euryope</i> *, ♂	LX.	12, 13	ii. 186	— <i>pallas</i> , ♀	LXIX.	5, 6	ii.
— <i>oreas</i> *, ♂	LX.	17, 18	ii. 186	— <i>ornythion</i> , ♂	LXIX.	7, 8	ii. 227
— <i>deione</i> *, ♂	LX.	5	ii. 186	— <i>telus</i> , ♂	LXX.	1, 2	ii.
—, ♀	LX.	6, 7	ii. 186	—, ♀	LXX.	3, 4	ii.
PAPILIONINÆ.				— <i>tolmides</i> , ♂	LXX.	5	ii.
<i>Papilio childrenæ</i> , ♂	LXV.	1, 3	ii. 192	— <i>erostratus</i> , ♂ (genitalia)	LXIX.	9	ii.
—, ♀	LXV.	2	ii. 192	— <i>pandion</i> , ♂	LXX.	6, 7, 11	ii. 230
— <i>iphidamas</i> , ♂ (genitalia &c.)	LXV.	5, 5 a	ii. 192, 727	— <i>rogeri</i> , ♂	LXX.	8, 9	ii.
— <i>sadyattes</i> , ♂	LXV.	4	ii. 195, 728	— <i>polycharmus</i> , ♂	LXX.	10	ii.
— <i>polyzclus</i> , ♂ (genitalia)	LXV.	6	ii. 195	— <i>zalates</i> , ♂	LXXI.	1, 2, 3	ii.
— <i>photinus</i> , ♂ (genitalia &c.)	LXV.	7, 7 a	ii. 196, 728	— <i>phaeton</i> , ♂ (genitalia)	LXXI.	6	ii.
— <i>montezuma</i> , ♂ (genitalia &c.)	LXV.	8, 8 a	ii. 197	— <i>cephalus</i> , ♂	LXXI.	4, 5	ii.
— <i>alopius</i> , ♀	LXV.	10, 11	ii. 197, 728	— <i>eurotas</i> , ♂ (genitalia)	LXXI.	7	ii.
— <i>mylotes</i> , ♂ (genitalia &c.)	LXV.	9, 9 a	ii. 198	— <i>birchalli</i> , ♂	LXXI.	8, 9, 10	ii.
— <i>mycale</i> , ♂ ♀	LXV.	12, 13 §	ii. 199	— <i>asclepius</i> , ♂ (genitalia)	LXXII.	3	ii.
— <i>polydamas</i> , ♂ (genitalia)	LXV.	14	ii. 200	— <i>electryon</i> , ♂	LXXII.	1, 2	ii.
— <i>lycidas</i> , ♂ (genitalia)	LXV.	17	ii. 201, 728	— <i>syedra</i> , ♂ ♀	LXXII.	4, 5	ii.
— <i>numitor</i> , ♀	LXVI.	1	ii. 202, 728	— <i>daunus</i> , ♂ (genitalia)	LXXII.	9	ii.
—, ♂	LXVI.	2, 3	ii. 202, 728	— <i>pilumnus</i> , ♂ (genitalia)	LXXII.	10	ii.
				— <i>alexiares</i> , ♂	LXXII.	6, 7	ii.

* Placed under the genus *Leptalis* on the Plate.† *Acmepteron lala* on the Plate.‡ *Leptalis jethys*, ♀, on the Plate.

§ Wrongly marked 12, 13 ♀ on the Plate.

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
<i>ilio americanus</i> , ♂ (genitalia) ..	LXXII.	8	ii. 243	<i>Eudamus aleiphron</i> , ♀	LXXV.	24, 25	ii. 285
<i>ronia brevicornis</i> , ♂	CXI.	15, 16	ii. 730	— <i>metallescens</i> , ♂	LXXV.	27-29	ii. 285, 733
— —, ♀	CXI.	17, 18	ii. 730	— <i>undulatus</i> , ♂ (genitalia) ..	LXXV.	30	ii. 286
HESPERIIDÆ.				<i>Goniurus cœlus</i> , ♂ (genitalia) ..	LXXVI.	1	ii. 287, 733
PYRRHOPTIGINÆ.				— <i>talus</i> , ♂ (genitalia)	LXXVI.	2	ii. 288
<i>rrhopyge phidias</i> , ♂ (genitalia).	LXXIII.	4	ii. 246	<i>Plestia staudingeri</i> , ♂	LXXVI.	3, 4	ii. 289
— <i>zenodorus</i> , ♂	LXXIII.	1, 2, 3	ii. 247	— <i>elwesi</i> , ♂	LXXVI.	5-7	ii. 289
— <i>gellias</i> , ♂	CXII.	1, 2	ii. 248, 731	— <i>dorus</i> , ♂	LXXVI.	8, 9	ii. 290
— <i>scylla</i> , ♂	LXXIII.	5, 6	ii. 249	<i>Tarsoctenus gaudialis</i> , ♂	LXXVI.	10-13	ii. 290
— <i>jonas</i> , ♀	LXXIII.	7, 8	ii. 250	— <i>perissographus</i> , ♀	LXXVI.	14, 15	ii. 291
— <i>chalybea</i> , ♂ (genitalia) ..	LXXIII.	12	ii. 250	<i>Phocides pygmalion</i> , ♂ (genitalia).	LXXVI.	16	ii. 292, 733
— <i>æsculapius</i> , ♂ (genitalia) ..	LXXIII.	9	ii. 251	— <i>belus</i> , ♂	LXXVI.	17, 18	ii. 293, 733
— <i>creon</i> , ♂	LXXIII.	10, 11	ii. 251	— <i>distans</i> , ♂	LXXVI.	19-21	ii. 294, 733
— <i>erythrosticta</i> , ♂ (genitalia).	LXXIII.	13	ii. 252	— <i>urania</i> , ♂ (genitalia)	LXXVI.	22	ii. 294, 733
— <i>araxes</i> , ♂	LXXIII.	14-16	ii. 252	— <i>lilea</i> , ♂	LXXVI.	23, 24	ii. 296, 733
<i>ysoria venezuelæ</i> , ♂ (genitalia).	LXXIII.	17	ii. 254, 731	<i>Heteropia bryaxis</i> , ♂ (genitalia).	LXXVI.	25	ii. 297
— <i>affinis</i> , ♂	LXXIII.	19-21	ii. 255	— <i>cyda</i> , ♂	CXII.	7, 8	ii. 734
— <i>amra</i> , ♂ (genitalia)	LXXIII.	18	ii. 255	— <i>melon</i> , ♀	LXXVI.	26, 27	ii. 297, 734
— <i>galgala</i> , ♂ (genitalia)	LXXIII.	22	ii. 256	<i>Spathilepia clonius</i> , ♂ (genitalia).	LXXVI.	28	ii. 298
<i>nenis ponua</i> , ♂	LXXIII.	23, 24	ii. 257	<i>Epargyreus exadeus</i> , ♂ (genitalia)	LXXVII.	1	ii. 299, 734
— <i>pionia</i> , ♂ (genitalia)]	LXXIII.	25	ii. 258	— <i>gaumeri</i> , ♂	LXXVII.	2, 3	ii. 300
<i>anguna cosyra</i> , ♂	LXXIV.	1, 2	ii. 258	— <i>asander</i> , ♂ (genitalia)	LXXVII.	4	ii. 300
— <i>crida</i> , ♂ (genitalia)	LXXIV.	3	ii. 259	<i>Proteides idas</i> , ♂ (genitalia)....	LXXVII.	5	ii. 301, 734
<i>madia hospita</i> , ♂	LXXIV.	4, 5, 6	ii. 261	<i>Chrysoplectrum perniciosum</i> , ♂ .	LXXVII.	6-8	ii. 303
— <i>hewitsoni</i> , ♂	LXXIV.	7, 8, 9	ii. 262	<i>Acolastus amyntas</i> , ♂ (genitalia)	LXXVII.	9	ii. 304, 734
— <i>macleanani</i> , ♂	LXXIV.	10-12	ii. 262	<i>Telegonus anaphus</i> , ♂ (genitalia)	LXXVII.	10	ii. 305
— <i>patrobas</i> , ♂	LXXIV.	13-15	ii. 263	— <i>ampyx</i> , ♀	LXXVII.	11, 12	ii. 306
— <i>azeta</i> , ♂	LXXIV.	16, 17	ii. 264	— <i>hahneli</i> , ♂	LXXVII.	13, 14	ii. 306
<i>yscelus belti</i> , ♂	LXXIV.	21-23	ii. 265	— <i>chiriquensis</i> , ♂	LXXVII.	15, 16	ii. 308
— <i>hages</i> , ♂	LXXIV.	24-26	ii. 266	— <i>grullus</i> , ♂	LXXVII.	17, 18	ii. 308
<i>zonax typhaon</i>	LXXIV.	27, 28	ii. 267	— <i>alardus</i> , ♂ (genitalia)	LXXVII.	19	ii. 308
<i>xyntetra hopfferi</i> , ♂	LXXIV.	18	ii. 268	— <i>megalurus</i> (consus), ♂	LXXVII.	20-22	ii. 309, 734
— <i>felderi</i> , ♂ (genitalia)]	LXXIV.	19	ii. 268	— <i>apastus</i> , ♂ (genitalia)	LXXVII.	23	ii. 310
— <i>annulata</i> , ♀	LXXIV.	20	ii. 268	— <i>endemus</i> , ♂	LXXVII.	24, 25	ii. 310
HESPERIINÆ.				<i>Thymele fulgerator</i> , ♂ (genitalia)	LXXVIII.	1	ii. 311, 735
<i>udamus simplicius</i> , ♂ (genitalia).	LXXV.	1	ii. 270	— <i>polias</i> , ♀	CXII.	9, 10	ii. 735
— <i>chales</i> , ♂	LXXV.	2, 3	ii. 274	— <i>enotrus</i> , ♂ (genitalia)	LXXVIII.	2	ii. 312
— <i>chalco</i> , ♂ (genitalia)	LXXV.	4	ii. 275	— <i>eniopæus</i> , ♂	LXXVIII.	3, 4	ii. 312
— <i>proteus</i> , ♂ (genitalia)	LXXV.	5	ii. 277	— <i>fulviluna</i>	LXXVIII.	5, 6	ii. 313
— <i>esmeraldus</i> , ♂ (genitalia) ..	LXXV.	6	ii. 278	— <i>mephitis</i>	LXXVIII.	7, 8	ii. 313
— <i>dorantes</i> , ♂ (genitalia)	LXXV.	7	ii. 278, 731	— <i>egregius</i> , ♂ (genitalia)	LXXVIII.	9	ii. 314
— <i>zilpa</i> , ♂ (genitalia)	LXXV.	8	ii. 279, 731	— <i>phalæcus</i> , ♂	LXXVIII.	10-12	ii. 314
— <i>catillus</i> , ♂	LXXV.	9, 10	ii. 280	— <i>chrysorrhœa</i> , ♂	LXXVIII.	13, 14	ii. 315
— <i>albofasciatus</i> , ♂ (genitalia).	LXXV.	11	ii. 280, 732	— <i>aulestes</i> , ♂ (genitalia)	LXXVIII.	15	ii. 315, 735
— <i>alcæus</i> , ♂ (genitalia)	LXXV.	12	ii. 281, 732	<i>Telemiades avitus</i> , ♂ (genitalia).	LXXVIII.	16	ii. 317
— <i>ridens</i> , ♂	LXXV.	13-15	ii. 282	— <i>phasias</i> , ♂ (genitalia)	LXXVIII.	17	ii. 317
— <i>cachinnans</i> , ♂	CXII.	3, 4	ii. 732	— <i>megallus</i> , ♂	LXXIX.	1, 2	ii. 318
— <i>miltas</i>	LXXV.	18, 19	ii. 282	<i>Dyscophellus doriscus</i> , ♂ (geni- talia)	LXXVIII.	18	ii. 319
— <i>crison</i> , ♀	LXXV.	16, 17	ii. 282, 732	<i>Nascus phocus</i> , ♂ (genitalia) ..	LXXVIII.	19	ii. 320
— <i>biolleyi</i> , ♂	CXII.	5, 6	ii. 732	— —, ♀, var.	CXII.	11, 12	ii. 735
— <i>auginus</i> , ♂ (genitalia)	LXXV.	26	ii. 283	— <i>cous</i> (eugamon), ♂	LXXVIII.	20, 21	ii. 321, 735
— <i>uginulus</i> , ♂ (genitalia) ..	LXXV.	20-22	ii. 284	— <i>gizala</i> (evathlus), ♀	LXXVIII.	22, 23	ii. 322, 736
— <i>octomaculatus</i> , ♂ (genitalia)	LXXV.	23	ii. 284	— <i>cæpio</i> , ♂	LXXIX.	3-5	ii. 322, 736
				— <i>advena</i> , ♂	LXXIX.	6, 7	ii. 323
				<i>Bungalotis midas</i> , ♂ (genitalia) ..	LXXIX.	8	ii. 324, 736
				— <i>ramusis</i> , ♂	LXXIX.	9-11	ii. 325

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
Bungalotis ramusis, ♀	LXXIX.	12	ii. 325	Pellicia bromias, ♂	LXXXIII.	13, 14	ii. 376
— heras, ♂	LXXIX.	16-18	ii. 325	— —, ♀	LXXXIII.	15	ii. 376
— —, ♀	CXII.	13, 14	ii. 737	— costimacula, ♂	LXXXIII.	16-18	ii. 376
— dexo, ♂	LXXIX.	13, 14	ii. 326	— didia, ♂	LXXXIII.	19-21	ii. 376
— —, ♀	LXXIX.	15	ii. 326	— —, ♀	LXXXIII.	22, 23	ii. 376
— salatis, ♂ (genitalia)	LXXX.	1	ii. 326	— meno, ♂	LXXXIII.	24, 25	ii. 376
Cecropterus neis, ♂ (genitalia)	LXXX.	2	ii. 328, 737	— thyestes, ♂	LXXXIII.	26, 27	ii. 376
— cinctus, ♀	LXXX.	3	ii. 329	— polyctor, ♂	LXXXIII.	28-30	ii. 376
— aunus, ♂ (genitalia)	LXXX.	4	ii. 330	Mycteris cœrulea, ♂	LXXXIII.	31-33	ii. 376
— capys, ♂	LXXX.	5-7	ii. 330	Nisoniades (?) pelarge, ♂	LXXXIV.	1-3	ii. 376
Rhabdoides cellus, ♂ (genitalia)	LXXX.	8	ii. 331	Cyclosœmia anastomosis, ♂	LXXXIV.	4-6	ii. 376
— epigona, ♂	LXXX.	9-11	ii. 332	— phidyte, ♀	LXXXIV.	7, 8	ii. 376
Murgaria albociliata, ♂	LXXX.	12-14	ii. 333, 737	Anastrus nœris, ♂	LXXXIV.	9-11	ii. 376
Thorybes mexicanus, ♂	LXXX.	15-17	ii. 334	— —, ♀	LXXXIV.	12	ii. 376
Phœdinus caieus, ♂	LXXX.	18-20	ii. 335	Gorgophone melibœa, ♂	LXXXIV.	13, 14	ii. 376
— aventinus, ♂	LXXX.	21, 22	ii. 335	Echelatus varius, ♂	LXXXIV.	15, 16	ii. 376
Cocceius pylades, ♂ (genitalia)	LXXX.	23	ii. 336	— luctuosus, ♂	LXXXIV.	17, 18	ii. 376
Cabares potrillo, ♂	LXXX.	24-26	ii. 337	— sempiternus, ♂	LXXXIV.	19-21	ii. 376
— enops, ♂	LXXX.	27, 28	ii. 338	— eugramma, ♀	LXXXIV.	22, 23	ii. 376
Cogia cajeta, ♂	LXXXI.	1-3	ii. 339	Grais stigmaticus, ♂	LXXXIV.	24-26	ii. 376
— cluina, ♂	LXXXI.	4, 5	ii. 339, 737	Celœnorrhinus eligius, ♂ (geni- talia)	LXXXV.	1	ii. 376
— calchas, ♂ (genitalia)	LXXXI.	6	ii. 340	— fritzgærtneri (variega- tus), ♂	LXXXV.	2-4	ii. 376
— hippalus, ♂	LXXX.	29-31	ii. 340, 737	— chiriensis, ♂	LXXXV.	5-7	ii. 376
Typhedanus alladius, ♂	LXXXI.	7-9	ii. 342, 738	Mylon lassia, ♂	LXXXV.	8-10	ii. 376
Cœcina calanus, ♂	LXXXI.	10-12	ii. 343	— pulcherius, ♂	LXXXV.	11-13	ii. 376
Æthilla echina, ♂	LXXXI.	13, 14	ii. 344, 738	Eudamidas melander, ♂ (geni- talia)	LXXXV.	14	ii. 376
Orneates ægiochus, ♂	LXXXI.	15-17	ii. 346	— ozema, ♂	LXXXV.	15-17	ii. 376
Hydrænomia orcinus, ♂ (geni- talia)	LXXXI.	18	ii. 347	Xenophanes tryxus, ♂ (genitalia)	LXXXV.	18	ii. 376
Paradros formosus, ♂	LXXXI.	19-21	ii. 348	Carrhenes fuscescens, ♂	LXXXV.	19-21	ii. 376
Drephalys helixus, ♂	LXXXI.	22-24	ii. 349	— calidius, ♂	LXXXV.	22, 23	ii. 376
Lignystola laeudus, ♂ (geni- talia)	LXXXI.	25	ii. 350	— callipetes, ♂	LXXXV.	24-26	ii. 376
Hyalothyrus neleus, ♀	LXXXI.	27	ii. 351	— meridensis, ♂	LXXXV.	27, 28	ii. 376
Phanus vitreus, ♂ (genitalia)	LXXXI.	26	ii. 352	— canescens, ♂	LXXXV.	29, 30	ii. 376
Entheus matho, ♂	LXXXI.	28, 29	ii. 355	— leada, ♂	LXXXV.	31, 32	ii. 376
— —, ♀	LXXXI.	30	ii. 355	[Potamanax paralus, ♂ (geni- talia)]	LXXXVI.	1	ii. 376
Artenrotia tractipennis, ♂ (ge- nitia)	LXXXII.	1	ii. 357	— pammenes, ♀	LXXXVI.	2, 3	ii. 376
Pythonides cerialis, ♂ (genitalia)	LXXXII.	2	ii. 358, 738	— melicertes	LXXXVI.	4	ii. 376
— contubernalis, ♂	LXXXII.	3-5	ii. 359	— caliadne, ♂	LXXXVI.	5, 6	ii. 376
— anicius, ♂	LXXXII.	6, 7	ii. 360	— xantholeuce, ♀	LXXXVI.	7	ii. 376
— belti, ♂	LXXXII.	8-10	ii. 360	Achlyodes fridericus, ♂ (genitalia)	LXXXVI.	8	ii. 376
— lugubris, ♂	LXXXII.	11-13	ii. 361	— cœliginea (caliginea), ♂	LXXXVI.	9, 10	ii. 376
— zera, ♂	LXXXII.	14-16	ii. 362	— calavius, ♂	LXXXVI.	11, 12	ii. 376
— menedemus, ♂	LXXXII.	17, 18	ii. 362	— bubaris, ♂	LXXXVI.	13, 14	ii. 376
— hyacinthinus, ♂	LXXXII.	19-21	ii. 362	— simplex, ♀	LXXXVI.	15, 16	ii. 376
— scybis, ♂	LXXXII.	22, 23	ii. 363	— cyrna (fasciata), ♀	LXXXVI.	17	ii. 376
— phila, ♂	LXXXII.	24, 25	ii. 363	— colotes, ♀	LXXXVI.	18, 19	ii. 376
— pelopea, ♂	LXXXII.	26, 27	ii. 363	— oiclus, ♀	LXXXVI.	20, 21	ii. 376
Spioniades artemides, ♂	LXXXII.	28-30	ii. 364	Sostrata scintillans, ♂	LXXXVI.	22-24	ii. 376
Eracon biternata, ♂	LXXXIII.	1, 2	ii. 366	— pusilla, ♂	LXXXVI.	25, 26	ii. 376
Gorgopas viridiceps, ♂	LXXXIII.	3-5	ii. 366	Paches loxus, ♂ (genitalia)	LXXXVI.	27	ii. 376
Pellicia tiphys, ♂	LXXXIII.	6-8	ii. 368	— polla, ♂	LXXXVI.	28, 29	ii. 376
— —, ♀	LXXXIII.	9, 10	ii. 368	— subalbatus, ♀	LXXXVI.	30	ii. 376
— macareus, ♂ (genitalia)	LXXXIII.	11	ii. 369				
— nyctineme, ♂ (genitalia)	LXXXIII.	12	ii. 370				

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
proxenus, ♂	LXXXVI.	31-33	ii. 401	Staphylus giselus, ♂	LXXXIX.	24-26	ii. 435
- pteras, ♂	LXXXVI.	34, 35	ii. 401	— imbras, ♂	LXXXIX.	27, 28	ii. 435
- amaryllis, ♂	LXXXVI.	36, 37	ii. 402	— —, ♀	LXXXIX.	29	ii. 435
- anion hemes, ♂ (genitalia)]	LXXXVII.	1	ii. 403	— saletas, ♂ (genitalia) . . .	LXXXIX.	30	ii. 436
- marciana, ♂	LXXXVII.	2, 3	ii. 403	— evemerus, ♂	LXXXIX.	31, 32	ii. 436
- marica, ♀	LXXXVII.	4, 5	ii. 403	— unifascia, ♂	XC.	1, 2	ii. 437
- tis busirus, ♂ (genitalia) . .	LXXXVII.	6	ii. 404, 740	Scantilla opites, ♂	XC.	3-5	ii. 437
- thraso, ♂ (genitalia) . . .	LXXXVII.	7	ii. 405, 740	Paramimus stigma, ♂ (genitalia)	XC.	6	ii. 438
- pallida, ♂	LXXXVII.	8-10	ii. 406	Timochreon satyrus, ♂ (genitalia)	XC.	7	ii. 439
- eres hewitsonius (mexica- } us), ♂ (genitalia) }	LXXXVII.	11	ii. 407, 740	Zopyrion sandace, ♂	XC.	8-10	ii. 440
- ices anticus, ♂	LXXXVII.	12-14	ii. 408	Pholisora mexicana, ♂	XC.	11, 12	ii. 441
- igonus nearchus, ♂ (genitalia)	LXXXVII.	15	ii. 409	— clytius, ♂	XC.	13, 14	ii. 442
- aseae crosa, ♂ (genitalia) . . .	LXXXVII.	16	ii. 411	— alpheus, ♂ (genitalia) . . .	XC.	15	ii. 442
- funebris, ♂	LXXXVII.	17-19	ii. 411	Atarnes sallæi, ♂ (genitalia) . .	XC.	16	ii. 443
- corrosa, ♂	LXXXVII.	20, 21	ii. 412	Heliopetes arsalte, ♂	XC.	17-19	ii. 445
- emorsa, ♀	LXXXVII.	22, 23	ii. 413	— alana, ♂	XC.	20, 21	ii. 446
- pulverulenta, ♂	LXXXVII.	24, 25	ii. 413	— nivella, ♂	XC.	22-24	ii. 446
- us lacæna, ♂ (genitalia) . . .	LXXXVII.	26	ii. 414	— cnemus, ♀	XC.	25, 26	ii. 448
- nses hyalophora, ♂	LXXXVII.	27-29	ii. 415	Hesperia syrichtus, ♂ (genitalia)	XC.	27	ii. 449
- danes panætius, ♂	LXXXVII.	30, 31	ii. 416	— montivaga, ♂	XC.	28-30	ii. 450
- brontinus, ♂	LXXXVII.	32-34	ii. 416	— notata, ♂	XC.	31, 32	ii. 451
- ochares trifasciatus, ♂ (ge- } italia) }	LXXXVIII.	3	ii. 417	Celotes nessus, ♀	XCI.	27, 28	ii. 452
- ruptifasciatus, ♂	LXXXVIII.	1, 2	ii. 418	— —, ♂ (genitalia)	XCI.	29	ii. 452
- ietas osyris, ♂ (genitalia) . .	LXXXVIII.	4	ii. 419, 740	Chiomara asychis, ♂	XCI.	1-3	ii. 453, 741
- anacreon, ♂	LXXXVIII.	5-7	ii. 419	— mithrax, ♂	XCI.	4-6	ii. 454
- ecliptica, ♂	LXXXVIII.	8-10	ii. 420	— gesta, ♂	XCI.	7-9	ii. 455
- (?) impressa, ♂	LXXXVIII.	11, 12	ii. 421	Thanaos funeralis, ♂	XCI.	10-12	ii. 456
- aptopleura theramenes, ♂	LXXXVIII.	13-15	ii. 421	— —, ♀	XCI.	13, 14	ii. 456
- tisia, ♂	LXXXVIII.	16	ii. 423	— tristis, ♂ (genitalia)	XCI.	15	ii. 457
- choridas phalænoides, ♂ (ge- } italia) }	LXXXVIII.	17	ii. 423	— mæstus, ♂ (genitalia)	XCI.	18	ii. 457
- palpalis, ♂	LXXXVIII.	18, 19	ii. 424	— pacuvius, ♂	XCI.	16, 17	ii. 458
- gythion pyralina, ♂	LXXXVIII.	20-22	ii. 425	— albomarginatus, ♂	XCI.	19-21	ii. 458
- begga, ♂	LXXXVIII.	23	ii. 425	— —, ♀	XCI.	22, 23	ii. 458
- sochoria polysticta, ♂	LXXXVIII.	24-26	ii. 427	— afranius, ♂	XCI.	24-26	ii. 459
- agenes ægides*, ♂	LXXXVIII.	27-29	ii. 428				
- lactifera, ♂	XCI.	30-32	ii. 459	PAMPHILINÆ.			
- stator, ♂	XCI.	33-35	ii. 460	Butleria microsticta, ♀	XCII.	1, 2	ii. 464
- phylus cylindus, ♂	LXXXIX.	1-3	ii. 430	— —, ♂ (genitalia)	XCII.	3	ii. 464
- cupreiceps, ♂	LXXXIX.	4-6	ii. 430	— anomala †, ♂	XCII.	4-6	ii. 464
- aurocapilla, ♂	LXXXIX.	9-11	ii. 431	— pulchra, ♂	XCII.	7, 8	ii. 465
- ceos, ♂	LXXXIX.	7, 8	ii. 432	— eryonas, ♂	XCII.	9-11	ii. 465
- mazans (ascalaphus), ♂	LXXXIX.	12-14	ii. 432, 740	— lalage, ♂	XCII.	12, 13	ii. 466
- — (—), ♀	LXXXIX.	15	ii. 432, 740	— octomaculata, ♂	XCII.	14, 15	ii. 466
- hayhursti, ♂ (genitalia)] . .	LXXXIX.	16	ii. 433	— faula, ♂	XCII.	16, 17	ii. 466
- aztecus, ♂ ♀	LXXXIX.	17, 18	ii. 433	Pamphila dardaris, ♂	XCII.	18-21	ii. 467
- evippe, ♂	LXXXIX.	19, 20	ii. 433	— Apautus menes, ♂ (genitalia) . .	XCII.	22	ii. 468
- orsines, ♂	LXXXIX.	21, 22	ii. 434	Oarisma powesheik ‡, ♂	XCII.	23-25	ii. 469
- brennus, ♂ (genitalia)	LXXXIX.	23	ii. 434	— garita §, ♂	XCII.	26-29	ii. 470
				Adopæoides simplex, ♂	XCII.	30-33	ii. 470
				— —, bistriata, ♀	XCII.	34	ii. 471
				Ancyloxypha arene , ♂	XCII.	35-38	ii. 472

* *Eropus ægides* on the Plate.† *Butleria leucospila* on the Plate.‡ *Paradopæa garita* on the Plate.§ *Paradopæa calega* on the Plate.|| *Ancyloxypha myrtis* on the Plate.

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
<i>Copaëodes aurantiaca</i> , ♂	XCII.	39-42	ii. 473	<i>Amblyscirtes elissa</i> , ♀ ♂	XCV.	40, 41	ii.
<i>Chærephon citrus</i> , ♂	XCIII.	1-4	ii. 475	<i>Hulotus saxula</i> , ♂	XCV.	42-44	ii.
— <i>rhesus</i> , ♀	XCIII.	5, 6	ii. 475	<i>Calpodes ethlius</i> , ♂ (wing &c.)	XCV.	45, 46	ii.
— —, ♂ (genitalia)	XCIII.	7	ii. 475	<i>Prenes evadnes</i> , ♂ (wing &c.)	XCV.	47, 48	ii.
<i>Hylephila phylæus</i> , ♂ (genitalia)	XCIII.	8	ii. 476	— <i>pauper</i> , ♂	XCVI.	1-3	ii.
<i>Erynnis morrisoni</i> , ♂	XCIII.	9, 10	ii. 478	— <i>nero</i> , ♂ (genitalia)	XCVI.	4	ii.
<i>Atalopedes campestris</i> , ♂ (genitalia)	XCIII.	11	ii. 479	— —, ♀	XCVI.	5, 6	ii.
<i>Thymelicus vibex</i> , ♂	XCIII.	12-14	ii. 480	— —, var. <i>corrupta</i> , ♂	XCVI.	7	ii.
— —, ♀	XCIII.	15, 16	ii. 480	— <i>philippina</i> , ♂	XCVI.	8, 9	ii.
— <i>athenion</i> , ♂ (genitalia)	XCIII.	17	ii. 481	— <i>ares</i> , ♂	XCVI.	10-12	ii.
<i>Catia druryi</i> , ♂ (genitalia)	XCIII.	18	ii. 482	— <i>ocola</i> , ♂	XCVI.	13-15	ii.
<i>Ochlodes snowi</i> , ♂	XCIII.	19-21	ii. 483	— <i>vala</i> , ♂	XCVI.	16-18	ii.
— —, ♀	XCIII.	22, 23	ii. 483	<i>Cydrus nævolus</i> , ♂	XCVI.	19-21	ii.
<i>Augiades heras</i> , ♂	XCIII.	24-26	ii. 484	<i>Aides epitus</i> , ♂	XCVI.	22, 23	ii.
— <i>hecale</i> , ♂	XCIII.	27-29	ii. 484	— <i>dysoni</i> , ♀	XCVI.	24	ii.
<i>Zariaspea mys</i> , ♂	XCIII.	30, 31	ii. 485	— <i>elara</i> , ♂	XCVI.	25, 26	ii.
— <i>mythecus</i> , ♂	XCIII.	32-34	ii. 486	<i>Paraides ocerinus</i> , ♂	XCVI.	27-30	ii.
— —, ♀	XCIII.	35, 36	ii. 486	<i>Xeniades orchamus</i> , ♂ (genitalia)	XCVI.	31	ii.
<i>Poanopsis puxillius</i> , ♂	XCIII.	37-40	ii. 487	— <i>pteras</i> , ♂	XCVI.	32-35	ii.
<i>Paratrytone rhexenor</i> , ♂	XCIII.	41-43	ii. 488	<i>Telles arcalaus</i> , ♂ (genitalia)	XCVI.	36	ii.
— <i>polyclea</i> , ♂	XCIII.	44, 45	ii. 488	<i>Thespheus dalmani</i> , ♂	XCVI.	37-40	ii.
[<i>Phycanassa viator</i> , ♂ (genitalia)]	XCIV.	1	ii. 489	— <i>macareus</i> , ♂	XCVI.	41-43	ii.
— <i>psaumis</i> , ♀	XCIV.	2, 3	ii. 489	— <i>ovinia</i> , ♂	XCVII.	1, 2	ii.
<i>Atrytone delaware</i> , ♂	XCIV.	4-6	ii. 490	<i>Vacerra litana</i> , ♂	XCVII.	3-6	ii.
— <i>zabulon</i> , ♂ (genitalia)	XCIV.	7	ii. 490	— —, ♀	XCVII.	7, 8	ii.
— <i>rolla</i> , ♂	XCIV.	8-10	ii. 491	— <i>egla</i> , ♂	XCVII.	9-11	ii.
— <i>vitellius</i> , ♂	XCIV.	11-13	ii. 492	— <i>lachares</i> , ♀	XCVII.	12, 13	ii.
— <i>mella</i> , ♂	XCIV.	14-16	ii. 492	— <i>canente</i> , ♂ (genitalia)	XCVII.	14	ii.
— <i>mellona</i> , ♂	XCIV.	17-19	ii. 493	— —, ♀	XCVII.	15, 16	ii.
— <i>myron</i> , ♂	XCIV.	20-22	ii. 493	<i>Tirynthia conflua</i> , ♂	XCVII.	17, 18	ii.
— —, ♀	XCIV.	23, 24	ii. 493	— —, ♀	XCVII.	19, 20	ii.
— <i>helva</i> , ♂	XCIV.	25-27	ii. 494	<i>Niconiades xanthaphes</i> , ♂ } (wing &c.)	XCVII.	21, 22	ii.
— —, ♀	XCIV.	28, 29	ii. 494	— <i>cæso</i> , ♂	XCVII.	23-25	ii.
— <i>melane</i> , ♂	XCIV.	30-32	ii. 494	— <i>merenda</i> , ♂	XCVII.	26, 27	ii.
— —, ♀	XCIV.	33, 34	ii. 494	— <i>viridiceps</i> , ♀	XCVII.	28, 29	ii.
— <i>gala</i> , ♂	XCIV.	35, 36	ii. 495	<i>Oxyntes coruscus</i> , ♂	XCVII.	30-33	ii.
— <i>monticola</i> , ♂	XCIV.	37-39	ii. 495	<i>Phemiades propertius</i> , ♂ (genitalia)	XCVII.	34	ii.
— —, ♀	XCIV.	40	ii. 495	<i>Thoon modius</i> , ♂	XCVII.	35-38	ii.
— <i>niveolimbus</i> , ♂	XCIV.	41-43	ii. 496	— <i>taxes</i> , ♂	XCVII.	39, 40	ii.
— <i>inimica</i> , ♂	XCIV.	44-46	ii. 496	<i>Rhinthon chiriquensis</i> , ♂	XCVII.	41-44	ii.
— —, ♀	XCIV.	47	ii. 496	— <i>cynea</i> , ♂	XCVIII.	1-3	ii.
<i>Buzyges idothea</i> , ♂	XCV.	1-3	ii. 497	— <i>alus</i> , ♂	XCVIII.	4-6	ii.
— —, ♀	XCV.	4, 5	ii. 497	— <i>melius</i> , ♂ ♀	XCVIII.	7, 8	ii.
<i>Atrytonopsis deva</i> , ♂	XCV.	6-9	ii. 498	— <i>epaphus</i> , ♂	XCVIII.	9, 10	ii.
— —, ♀	XCV.	10	ii. 498	— <i>megalops</i> , ♂	XCVIII.	11-13	ii.
— <i>pittacus</i> , ♂	XCV.	11-13	ii. 498	<i>Cobalus fidicula</i> , ♂	XCVIII.	14-16	ii.
— <i>python</i> , ♀	XCV.	14, 15	ii. 499	— <i>gabina</i> , ♂	XCVIII.	17, 18	ii.
<i>Lerodea eufala</i> , ♂	XCV.	16-18	ii. 500	— <i>argus</i> , ♂	XCVIII.	19-21	ii.
— <i>dysaules</i> , ♂	XCV.	19, 20	ii. 500	— <i>percosius</i> , ♂	XCVIII.	22-24	ii.
<i>Stomyles tolteca</i> , ♂	XCV.	21-23	ii. 501	— <i>cannæ</i> , ♂	XCVIII.	25-27	ii.
— <i>florus</i> , ♂ (genitalia)	XCV.	24	ii. 502	— <i>warra</i> , ♂	XCVIII.	28	ii.
— <i>comus</i> , ♀	XCV.	25, 26	ii. 502	<i>Cobalopsis edda</i> , ♂	XCVIII.	29-31	ii.
— <i>nereus</i> , ♂	XCV.	27-30	ii. 502	— —, ♀	XCVIII.	32	ii.
<i>Amblyscirtes nanno</i> , ♂	XCV.	31-34	ii. 504	— <i>dyscritus</i> , ♂ (genitalia)	XCVIII.	33	ii.
— <i>folia</i> , ♂	XCV.	35, 36	ii. 504	<i>Onophas columbaria</i> , ♂	XCVIII.	34-37	ii.
— <i>fluonia</i> , ♂	XCV.	37-39	ii. 504				

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
<i>Ceonus pyste</i> , ♂	XCVIII.	38-41	ii. 540	<i>Molo heræa</i> , ♂	CI.	34-37	ii. 580
<i>Mucia thyia</i> , ♂	XCVIII.	42-44	ii. 541	[<i>Vinius arignote</i> , ♂]	CI.	38-41	ii. 580
<i>Morys valerius</i> , ♂	XCVIII.	45-47	ii. 542	— <i>sagitta</i> , ♂	CI.	42, 43	ii. 581
<i>Perimeles remus</i> , ♂	XCIX.	1-3	ii. 543	<i>Padraona epictetus</i> , ♂	CI.	44-46	ii. 582
<i>Tigasis zalates</i> , ♂	XCIX.	4, 5	ii. 544	<i>Carystus claudianus</i> , ♂	CII.	1-4	ii. 583
<i>Eutychide cingulicornis</i> , ♂	XCIX.	6-9	ii. 545	— <i>cynaxa</i> , ♂	CII.	5, 6	ii. 584
— <i>midia</i> , ♂	XCIX.	10-13	ii. 546	— <i>ebusa</i> , ♂, var.	CII.	7, 8	ii. 584
— <i>ochus</i> , ♂	XCIX.	14-16	ii. 546	— —, ♂ (genitalia)	CII.	9	ii. 584
— <i>orthos</i> , ♂	XCIX.	17-19	ii. 546	— <i>marcus</i> , ♂ (genitalia)	CII.	10	ii. 584
— <i>lycortas</i> , ♂	XCIX.	20, 21	ii. 547	— <i>aurelius</i> , ♀	CII.	11, 12	ii. 585
— <i>asema</i> , ♂	XCIX.	22, 23	ii. 548	— <i>diversus</i> , ♂	CII.	13, 14	ii. 585
<i>Phanes (Phanis) justinianus</i> , ♂	XCIX.	24-27	ii. 549, 741	— <i>fantasos</i> , ♂ (genitalia)	CII.	15	ii. 586
<i>Euroto compta</i> , ♂	XCIX.	28-31	ii. 550	— <i>artona</i> , ♂	CII.	16-18	ii. 586
— <i>lyde</i> , ♂	XCIX.	32, 33	ii. 551	— <i>coryna</i> , ♂ (genitalia)	CII.	19	ii. 587
— <i>micythus</i> , ♂	XCIX.	34, 35	ii. 551	<i>Paracarystus hypargyra</i> , ♂	CII.	20-23	ii. 588
— <i>chlorocephala</i> , ♂	XCIX.	36	ii. 551	<i>Zenis minos</i> , ♂	CII.	24-27	ii. 589
— <i>cægrus</i> , ♂	XCIX.	37-39	ii. 552	<i>Vettius phyllus</i> , ♂ (wing &c.)	CII.	28, 29	ii. 590
<i>Phlebodes tiberius</i> , ♂	XCIX.	40-43	ii. 553	— <i>lafresnayi</i> , ♂	CII.	30-32	ii. 590
<i>Lerema accius</i> , ♂ (genitalia)	XCIX.	44	ii. 554	<i>Cæliades fisceila</i> , ♂	CII.	33-36	ii. 592
— <i>bipunctata</i> , ♂	XCIX.	45-47	ii. 555	<i>Dion gemmatus</i> , ♂	CII.	37, 38	ii. 593
— <i>peneia</i> , ♂	XCIX.	48, 49	iii. 555	<i>Flaccilla æcas</i> , ♂ (wing &c.)	CII.	39, 40	ii. 593
<i>Mæris striga</i> , ♂ (wing &c.)	C.	1, 2	ii. 556	<i>Cymænes malitiosa</i> , ♂	CII.	41-43	ii. 595
— <i>hyagnis</i> , ♂ (genitalia)	C.	3	ii. 557	— <i>lutulenta</i> , ♂	CII.	44, 45	ii. 595
<i>Metron chrysogaster</i> , ♂	C.	4-7	ii. 558	— <i>syraces</i> , ♂	CIII.	1-3	ii. 595
<i>Metrocles leucogaster</i> , ♂	C.	8, 9	ii. 559	— <i>silius</i> , ♂	CIII.	4-6	ii. 596
<i>Papias infuscatus</i> , ♂ (wing &c.)	C.	10, 11	ii. 560	— <i>berus</i> , ♂	CIII.	7-9	ii. 596
— <i>dictya</i> , ♂	C.	12, 13	ii. 560	— —, ♂, var.	CIII.	10	ii. 596
— <i>microsema</i> , ♂	C.	14, 15	ii. 561	<i>Mnaseas bicolor</i> , ♂	CIII.	11-13	ii. 597
— <i>phainia</i> , ♂ (genitalia)	C.	16	ii. 561	<i>Methionopsis modestus</i> , ♂	CIII.	14-16	ii. 599
<i>Mnasinoua patage</i> , ♂	C.	17-19	ii. 562	— <i>typhon</i> , ♂ (genitalia)	CIII.	17	ii. 599
<i>Metiscus atheas</i> *, ♂ (wing &c.)	C.	20, 21	ii. 563	<i>Eutocus phthia</i> , ♂	CIII.	18-20	ii. 600
<i>Methion melas</i> , ♂ (wing &c.)	C.	22, 23	ii. 564	<i>Eprius (Epeus) velela</i> , ♂	CIII.	21-23	ii. 601, 741
<i>Thargella fuliginosa</i> , ♂ (wing &c.)	C.	24, 25	ii. 565	<i>Mnasicles geta</i> , ♂	CIII.	24-26	ii. 602
<i>Mnasitheus cephis</i> , ♂ (wing &c.)	C.	26, 27	ii. 566	— <i>hicetaon</i> , ♂ (genitalia)	CIII.	27	ii. 603
— <i>simplicissimus</i> , ♂ (wing &c.)	C.	28, 29	ii. 566	<i>Callimormus juvenis</i> , ♂	CIII.	28-31	ii. 604
<i>Mnasalcas uniformis</i> , ♂ (wing &c.)	C.	30, 31	ii. 567	— <i>filata</i> , ♂	CIII.	32, 33	ii. 604
<i>Mastor anubis</i> , ♂	C.	32-35	ii. 568	— <i>gracilis</i> , ♂ (genitalia)	CIII.	34	ii. 605
— <i>bellus</i> , ♂ (genitalia)	C.	36	ii. 568	— <i>corades</i> , ♂	CIII.	35-37	ii. 605
— <i>perigenes</i> , ♂	C.	37, 38	ii. 569	<i>Mnestheus ittona</i> , ♂	CIII.	38-41	ii. 606
<i>Mnasilus penicillatus</i> , ♂	C.	39-42	ii. 570	— <i>cometho</i> , ♂	CIII.	42-44	ii. 607
<i>Vehilius illudens</i> , ♂	C.	43-46	ii. 570	— <i>ludens</i> , ♂	CIII.	45, 46	ii. 607
— <i>venosus</i> , ♂	C.	47-49	ii. 571	[<i>Artines apitus</i> , ♂ (wing &c.)]	CIII.	47, 48	ii. 608
<i>Megistias tripunctatus</i> , ♂	CI.	1-3	ii. 572	— <i>artizies</i> , ♂	CIII.	49, 50	ii. 608
— <i>jera</i> , ♂	CI.	4, 5	ii. 572	[<i>Falga jceonia</i> , ♂]	CIV.	1-4	ii. 609
— <i>labdacus</i> , ♂	CI.	6, 7	ii. 573	— <i>seiras</i> , ♂	CIV.	5, 6	ii. 610
— <i>cæbasus</i> , ♂	CI.	8	ii. 573	<i>Enosis quadrinotata</i> , ♂	CIV.	7	ii. 610
— <i>isus</i> , ♂	CI.	9-11	ii. 574	<i>Carystoides basochesi</i> , ♂	CIV.	8-11	ii. 611
— <i>fraus</i> , ♂	CI.	12	ii. 574	<i>Lychnuchoides aptine</i> , ♂	CIV.	12-15	ii. 613
— <i>telata</i> , ♂	CI.	13-15	ii. 574	<i>Tisias myna</i> , ♂	CIV.	16, 17	ii. 614
— <i>epiberua</i> , ♂	CI.	16-18	ii. 575	<i>Themesion certima</i> , ♀	CIV.	18, 19	ii. 615
— <i>lencone</i> , ♂	CI.	19-21	ii. 575	— <i>orbis</i> , ♀	CIV.	20-21	ii. 615
<i>Parphorus storax</i> , ♂	CI.	22-25	ii. 576	<i>Turesis lucasi</i> , ♂	CIV.	22, 23	ii. 616
<i>Vorates decorus</i> , ♂	CI.	26-29	ii. 577	— <i>theate</i> , ♂	CIV.	24-26	ii. 617
— <i>sapala</i> , ♂	CI.	30, 31	ii. 578	<i>Megaleas syrna</i> , ♂	CIV.	27, 28	ii. 617
<i>Phærus epidius</i> , ♂	CI.	32, 33	ii. 579	<i>Lycas argenteus</i> , ♂ (wing &c.)	CIV.	29, 30	ii. 618

* *Mnasinous atheas* on the Plate.

LIST OF PLATES.

xlv

	Plate.	Fig.	Page.		Plate.	Fig.	Page.
[Orphe vatinius, ♂ (wing &c.)]..	CIV.	31, 32	ii. 619	Thracides placens, ♀	CVI.	1, 2	ii. 627
Damas clavus, ♂	CV.	1-4	ii. 621	— salius, ♂	CVI.	3-5	ii. 628
Orses cynisca, ♂ (wing &c.)	CV.	5, 6	ii. 622	— longirostris, ♂	CVI.	6-8	ii. 625
— iricolor, ♂	CV.	7, 8	ii. 623	— —, ♂, var.	CVI.	9	ii. 628
Thracides phidon, ♂ (wing &c.)..	CV.	9, 10	ii. 624	— chiomara, ♂ (genitalia) ..	CVI.	10	ii. 629
— deceptus, ♀	CV.	11, 12	ii. 624	— xanthura, ♂	CVI.	11-13	ii. 630
— luda, ♂	CV.	13-15	ii. 625	Perichares corydon, ♂ (wing &c.)	CVI.	14, 15	ii. 631
— molion, ♂	CV.	16-18	ii. 625	— agrippa, ♂	CVI.	16, 17	ii. 632
— seron, ♂	CV.	19, 20	ii. 625	— lotus, ♂	CVI.	18-20	ii. 632
— henricus, ♂	CV.	21-23	ii. 626	— —, ♀	CVI.	21, 22	ii. 632
— aroma, ♂ (genitalia)	CV.	24	ii. 626	Talides sergestus, ♂ (wing &c.)..	CVI.	23, 24	ii. 633
— —, ♀	CV.	25, 26	ii. 626	— —, ♂, var.	CVI.	25, 26	ii. 633
— aurifer, ♂	CV.	27, 28	ii. 626	Pyrrhopygopsis orasus, ♂	CVI.	27-30	ii. 634
— polles, ♀	CV.	29, 30	ii. 627				

ERRATA ET CORRIGENDA.

Page	Line	
10	36	for <i>I.</i> read <i>T.</i>
11	18	for <i>Tikorea</i> read <i>Tithorea</i> .
14	34	Before Tab. III. insert <i>Oleria xanthina</i> ,
18	8	for <i>ædesia</i> read <i>ædesia</i> .
20	6	for <i>Choacus</i> read <i>Chuacus</i> .
26	30	for <i>hæmimelæna</i> read <i>hemimelæna</i> .
28	2	for <i>Napeogenys</i> read <i>Napeogenes</i> .
29	8	for <i>Atayac</i> read <i>Atoyac</i> .
41	10	Before Tab. III. insert <i>Ithomia salvinia</i> ,
61	13	After Heterosais nephele . insert (<i>Ithomia</i> <i>nero</i> , Tab. V. fig. 9, ♂.)
62	8	for <i>arcesilaus</i> read <i>arcesilaus</i> .
70	27	for not interruptedly read interruptedly.
75	31	for <i>Pancina</i> read <i>Panima</i> .
77	3	for <i>ferrugineis</i> read <i>ferrugineo</i> .
84	27	for <i>Tagetis</i> read <i>Taygetis</i> .
94	27	for <i>Neonympha</i> read <i>Neonympha</i> .
94	29	for <i>epinephile</i> read <i>epinephele</i> .
98	39	for <i>D.</i> read <i>T.</i>
102	8	for 7 read 9.
103	16	for IX. read X.
104	5	for <i>peperna</i> read <i>perperna</i> .
104	16	for IX. read X.
113	16	for <i>Antirrhæa</i> read <i>Antirrhæa</i> .
114	6	for eight read nine.
122	18	for <i>P.</i> read <i>M.</i>
126	25	for no pencil on the costal side read a pencil on the inner side.
127	13	for <i>Valladolid</i> read <i>Valladolid</i> .
137	3	for <i>Oaxaca</i> read <i>Antioquia</i> .
141	15	for <i>Zumbador</i> read <i>Tumbador</i> .
154	20	for <i>A.</i> read <i>H.</i>
156	29	for <i>luce</i> read <i>leuce</i> .
160	34	for <i>Clerk</i> read <i>Clerck</i> .
171	4	for <i>Voan de Irazu</i> read <i>Volcan de Irazu</i> .
172	18	for <i>Olerk</i> read <i>Clerck</i> .
174	15	for EUPETOIETA read EUPTOIETA .
174	30	} for Eupetoieta read Euptoieta .
175	28	
174	16, 32	for <i>Eupetoieta</i> read <i>Euptoieta</i> .
179	18	for <i>Atayac</i> read <i>Atoyac</i> .
183	8	for <i>eranitis</i> read <i>eranites</i> and for <i>alcina</i> read <i>alsina</i> .
188	19	for <i>Calithomia</i> read <i>Callithomia</i> .
189	33	for <i>Clerk</i> read <i>Clerck</i> .
207	3	for <i>Atajac</i> read <i>Atoyac</i> .
209	31	for <i>aineta</i> read <i>anieta</i> .
211	17	for <i>Southern Mexico</i> read <i>Mexico</i> .
225	22	for <i>alemena</i> read <i>alcmena</i> .
230	15	for <i>cynantke</i> read <i>cyananthe</i> .
232	35	for <i>E.</i> read <i>M.</i>
243	{ several places }	for <i>pierrettii</i> and <i>pierettii</i> read <i>pierretii</i> .
259	23	for <i>lyæ</i> read <i>lycæ</i> .
259	25	for <i>Graytown</i> read <i>Greytown</i> .
261	19	for figg. 12, ♂, read figg. 11, 12, ♂.
262	19	after <i>rutila</i> add sp. n.

Page	Line	
264	14	for 2 read 1.
274	28	after PANACEA insert nomen nov.
282	23	for <i>V.</i> read <i>A.</i>
285	20	erase the word GUATEMALA at beginning of line.
292	24	before Tab. XXVII. insert <i>P. tipha</i> ,
293	34	for <i>Atajac</i> read <i>Atoyac</i> .
300	4	before Tab. XXX. insert <i>A. leucernia</i> ,
304	8	for <i>cythera</i> read <i>cytherea</i> .
309	7	after sentia add sp. n.
310	7	before San Gerónimo insert GUATEMALA ,
317	9	before Tab. XXXI. insert <i>Apatura cyane</i> ,
318	5	before Tab. XXXI. insert <i>Apatura cherubino</i> ,
333	4	after Siderone ide . insert (Tab. XXXVII. figg. 8, 9, ♂, var. <i>thebais</i> ; 10, ♀.)
334	22, 23	for <i>marpesia</i> read <i>marthesia</i> .
343	16	after promenæa add sp. n.
348	14	after Anæa proserpina . insert (Tab. XXXIII. figg. 7, 8, ♂; 9, 10, ♀.)
348	31	for Tab. XXXVI. read Tab. XXXVII.
351	1	for Tab. XXXIV. figg. 11, 12 read Tab. XXXVI. figg. 5, 6, ♂; 7, 8, ♀.
351	13	for <i>ænomais</i> read <i>ænomais</i> .
354	26	after opalina add sp. n.
355	6	for <i>Lefebre</i> read <i>Lueas</i> .
362	25	for NEBEOBIINÆ read NEMEOBIINÆ .
367	2	for <i>Eurygone</i> read <i>Eurygona</i> .
379	{ 15, 23, 31 }	for <i>mollina</i> read <i>molina</i> .
392	28	for <i>C.</i> read <i>E.</i>
403	26, 27	for <i>M.</i> read <i>T.</i>
407	34	for <i>Chemolimnas</i> read <i>Chamelinna</i> .
414	10	} for <i>melanochlorus</i> read <i>melanochlora</i> .
415	8	
416	27	after yucatanensis add sp. n.
420	26-28	erase the whole of the paragraph beyond the word Panama .
421	21	for <i>C. hedemanni</i> read <i>M. hedemanni</i> .
426	24	for <i>mollina</i> read <i>molina</i> .
432	6	for <i>peronæ</i> read <i>perone</i> .
432	11	for <i>ochreas</i> read <i>ochrias</i> .
435	31	for <i>A.</i> read <i>S.</i>
445	10	for <i>aries</i> read <i>ares</i> .
446	19	for <i>Atayac</i> read <i>Atoyac</i> .
449	29	for Tab. XLIII. figg. 25, 26 read Tab. XLIII. figg. 26, 27. (The numbers are also incor- rectly given at the bottom of the Plate.)
453	15	for they differ read it differs.
455	31	for <i>back</i> read <i>black</i> .
461	35	for <i>terra</i> read <i>tierra</i> .
464	32	for <i>molina</i> read <i>molela</i> .
466	31	for <i>this species</i> read <i>this genus</i> .
468	23	before Tab. XLVII. insert <i>Lemonias hepburni</i> ,
468	29	before Tab. XLVII. insert <i>Lemonias walkeri</i> ,
478	36	for <i>L.</i> read <i>N.</i>
479	13, 14	for godmanni read godmani .
482	17, 21	for <i>Atayac</i> read <i>Atoyac</i> .
482	17	for <i>Vindol.</i> read <i>Vindob.</i>

BIOLOGIA CENTRALI-AMERICANA.

ZOOLOGIA.

Class INSECTA.

Order LEPIDOPTERA.

Suborder RHOPALOCERA.

Fam. NYMPHALIDÆ.

Subfam. *DANAINÆ*.

Group DANAINA.

Male with a pair of anal pencils of hair; basal joint of palpi short; distal end of tarsus and tarsal joints of front leg of female flattened, so as to give a club-shaped termination to the leg; tibia of male as long as the femur; tarsus always present.

DANAIS.

Danais, Latreille, Encycl. Méth. ix. p. 10 (1819); Doubleday, Gen. Diurn. Lep. i. p. 89.

Subcostal of primaries with one branch before the end of the cell; cell of the secondaries elongated; discocellulars nearly in the same line and subparallel to the submedian nervure; a wart-like knob by the side of the first median branch in the male.

This genus has a wide range in the tropics; and several species also spread into the temperate zones in both hemispheres. America is not nearly so rich in species as many parts of the tropics of the Old World; still the number of individuals of each species is very great, as in all the more open parts of the country these butterflies are commonly met with. In Central America three species only are certainly recognizable; but these show considerable variation, each comprising several imperfectly segregated forms.

1. *Danais plexippus*.

Papilio plexippus, Linn. Syst. Nat. i. p. 767¹; Cramer, Pap. Ex. t. 206. f. E, F².

Danais plexippus, Strecker, Butt. N. Am. p. 105³.

Papilio archippus, Fabr. Ent. Syst. iii. p. 49⁴.

Danais archippus, Godt. Enc. Méth. ix. p. 184⁵; Butl. & Druce, P. Z. S. 1874, p. 330⁶.

BIOL. CENT.-AMER., Rhopal., Vol. 1, Sept. 1879.

Alis supra fulvis, marginibus late et venis distincte nigris; illis nisi costæ dimidio basali maculis serie duplici albo punctatis, anticarum apicibus rufo-nigris, maculis fulvis notatis: subtus ut supra, primariis pallidioribus, secundariis læte ochraceis, primariarum apicibus macula tripartita ochracea notatis.

Hab. N. AMERICA¹²³.—MEXICO, Oaxaca (*Fenochio*), Yucatan (*Hedemann, Mus. Vindob.*); GUATEMALA, Rio Polochic, Central valleys, Chuacus, Dueñas (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*⁶, *Carmirol*); PANAMA, Chiriqui (*Arcé*), Lion Hill (*M. Leannan*).—ANTILLES and WESTERN S. AMERICA to PERU.

Great confusion exists as to the correct identification of this name of Linnæus. In the tenth edition of his 'Systema Naturæ' (i. p. 471), in addition to the brief diagnosis, reference is made to Sloane's 'Natural History of Jamaica' (ii. p. 214, t. 239. f. 5, 6) and to Catesby's 'Natural History of Carolina' (ii. p. 88, t. 88); but the locality given is North America. Linnæus, in his 'Museum Ulricæ' (p. 262), seems to have doubted the accuracy of his reference to Catesby; but in the twelfth edition of the 'Systema' he recurs to his former opinion. Now, concerning Catesby's figure there can be no doubt; and, coupled with the North-American habitat, it indicates precisely to which species the name *D. plexippus* should be referred. Sloane's insect is undoubtedly another species, and is the same as that described by Mr. Bates (Ent. Month. Mag. i. p. 33) as *D. jamaicensis*, from specimens obtained by us in Jamaica. Fabricius, who seems to have been the originator of all the confusion, misapplies Linnæus's name and renames the true *D. plexippus* *D. archippus*⁴, and gives it a wrong habitat. Mr. Kirby (Cat. p. 5) applies Linnæus's name in a different sense altogether, for which we can see no justification. The synonymy of the species seems correctly given in Mr. Herman Strecker's work³.

Central-American specimens, as a rule, agree closely with North-American ones in having the spots towards the apex of the anterior wings tawny instead of pure white. In Nicaragua, however, and further to the southward specimens approach more nearly to the race prevalent in the north-western portions of the southern continent, and have these spots whiter and the veins of both wings more strongly margined with black. These characters are very slight, and show a tendency to a certain type rather than a present existing definable feature; and therefore we are unwilling to separate them. Still the divergence seems to commence in Nicaragua, all specimens found to the northward belonging to the northern form, whilst those to the southward generally, but not universally, belong to the southern. *D. erippus*, Cr., from Brazil, is a fairly defined race, in which we trace a constant character in the inner margin of the anterior wings. This portion is never deep black, as in *D. plexippus*, but (especially in female examples) tawny red.

Danaïs plexippus is extremely plentiful throughout Central America in all open sunny spots up to an elevation of 5000 or 6000 feet. Its flight is slow and somewhat laboured.

The rapid extension of the range of the North-American race of this butterfly, not only to Europe, but also to many islands of the South Pacific, to New Guinea, and Australia, has lately been traced by Mr. Distant (Trans. Ent. Soc. 1877, p. 93).

2. *Danais cleothera*.

Danais cleothera, Godt. Ene. Méth. ix. p. 185¹; Doubl. & Hew. Gen. Diurn. Lep. t. 12. f. 2².

Alis supra lateritio-fulvis parte basali et venis obscurioribus, marginibus externis late nigris, maculis albis serie duplii punctatis, cellulæ antearum termino maculis tribus albis notato, maculis tribus quoque apicis basin transeuntibus: subtus ut supra, secundariis magis brunnescentibus et venis latioribus nigris.

Hab. MEXICO, Oaxaca (*Fenochio*), Jalapa (*Deppe*, *Mus. Berol.*), Cordova (*Kümeli*); GUATEMALA, Rio Motagua, Central valleys (*F. D. G. & O. S.*); HONDURAS², San Pedro (*G. M. Whitely*); NICARAGUA, Virgin Bay (*Bridges*).—ANTILLES²; VENEZUELA².

Godart's description of this species is not very intelligible; and as he gives the island of Timor as the locality where it is found¹, there is room for error in assigning this name to an American *Danais*. We, however, follow Doubleday and Hewitson's identification of Godart's species; and here we are on surer ground, as the excellent plate in the 'Genera' clearly represents this species². It is readily distinguishable from the *D. berenice* by the absence of the inner row of large white spots between the median branches of the anterior wing. Its nearest ally is *D. eresimus*, Cr., of Guiana and the northern portions of the continent of South America. The specimens attributed to this species in Messrs. Butler and Druce's paper on Costa-Rica butterflies really belong to the following insect.

The range of *D. cleothera* in Central America is pretty general; but as yet we have seen no specimens from any locality south of Nicaragua. Doubleday and Hewitson state that it occurs in Venezuela, Haiti, and Honduras.

3. *Danais berenice*.

Papilio berenice, Cr. Pap. Ex. t. 205. f. E, F¹.

Danais berenice, Streeker, Butt. N. Am. p. 106².

Danais strigosa, Bates, Ent. Monthly Mag. i. p. 32³, Distant, Proc. Ent. Soc. 1876, p. x⁴.

Danais thersippus, Bates, P. Z. S. 1863, p. 243⁵.

Danais cleothera, Butl. & Druce, P. Z. S. 1874, p. 330 (nec Godt)⁶.

D. cleotheræ quoad colores valde similis, alarum postearum venis aliquando albo marginatis, anticis maculis tribus albis intra ramos medianos marginem externum versus notatis: subtus quoque *D. cleotheræ* similis, sed secundariarum cellulæ margine externo extus et intus albo maculato.

Hab. NORTH AMERICA^{1 2}.—MEXICO, Oaxaca (*Fenochio*), Vera Cruz (*Hedemann*, *Mus. Vindob.*), Cordova (*Kümeli*); GUATEMALA, Central valleys, Chuacus, Rio Motagua, Rio Polochic, Retalhuleu (*F. D. G. & O. S.*); BRITISH HONDURAS, Corosal (*Rowe*); NICARAGUA, Virgin Bay (*Bridges*), Chontales (*Belt*, *Janson*); COSTA RICA⁴ (*Van Patten*⁶), Oroqui (*Kramer*); PANAMA⁵, Calobre (*Arcé*), Lion Hill (*M'Leannan*).—CUBA; SOUTH AMERICA to SOUTHERN BRAZIL.

It may be questioned whether this species is distinct from *D. gilippus* (Cr. Pap. Ex. t. 26. f. C, D), the *patria* of which is Rio Janeiro, whence we have several specimens, and others which we attribute to the same race from Ceará and Maranhão, in Northern Brazil. *As a rule*, Central-American examples differ from these in the universal absence on the upper surface of white markings at the end of the cell of the secondary wings, whereas the nervures beneath are edged with white; but the development of these marks is by no means constant in Brazilian examples. Thus, in default of other trustworthy characters, it is not always easy to define certain Central-American specimens as distinct from others from Brazil.

Central-American specimens come nearest to Cramer's figures of his *Papilio berenice*¹; but in many the nervules on the upper surface of the secondary wings are edged with grey to a variable extent; and upon this character Mr. Bates based his *D. strigosa*³. Though noticeable in very many examples, we do not consider this character sufficiently established to justify our retaining this name, seeing that we find some specimens without any such markings, together with others bearing them to a prominent extent. *D. thersippus*⁵, based upon a single male specimen from Panama, seems, by the light of other specimens from the same and neighbouring localities, to be an extreme individual variety of the more ordinary form. The deep dull reddish-brown colour which characterizes this specimen is repeated in another from Costa Rica almost to the same extent; and looking through our series we can trace almost every link between this specimen and the ordinary typical form.

This widely ranging common species is found in abundance in all open sunny places up to an elevation of 5000 to 6000 feet.

ITUNA.

Ituna, Doubleday, Gen. Diurn. Lep. i. p. 113 (1847).

Subcostal of primaries with one branch before the end of the cell; cell of the secondaries short and triangular; lower and middle discocellulars placed at a large acute angle to the submedian; no wart-like knob near the first median branch in either sex.

The three species constituting this genus are spread over Central America and South America (except Guiana and the Lower Amazon) as far south as the Brazilian province of Rio Janeiro. *Ituna* is a peculiarly neotropical genus, not passing to the northwards of Southern Mexico. All the species seem to affect mountainous districts, though *I. phenarete* has been taken in the Upper Amazon. In having tufts of hair at the extremity of the abdomen, and none on the costal region of the secondary wings, the relationship of *Ituna* to *Lycorea* and *Danaïs* is shown.

1. *Ituna lamirus*.

Heliconius lamirus, Latr. in Humb. & Bonpl. Obs. Zool. ii. p. 126, t. 41. f. 7, 8 (1833)¹; Butl.

& Druce, P. Z. S. 1874, p. 330².

Lycorea lamyra, Boisd. Lép. de Guat. p. 28³.

Ituna albescens, Distant, Proc. Ent. Soc. 1876, p. xi⁴.

Alis primariis nigris, margine interno, et striga arcuata a basi ad angulum analem extensa, fulvis, striis tribus transversis subhyalinis, venis divisis, in dimidio apicali positis; posticis fulvis, costa et margine externo nigris, maculis indistinctis subhyalinis angulum apicalem versus notatis: subtus pallidior, maculis obscuris rufo tinctis, posticis medialiter albescentibus, margine externo maculis albis notato; primariorum apicibus quoque albo notatis.

Hab. MEXICO, Mountains of Oaxaca (*Fenochio*); GUATEMALA³, Rio Polochic, Chuacus (*F. D. G. & O. S.*); COSTA RICA⁴ (*Carmiol, Van Patten*²), Cache (*Rogers*); PANAMA, Calobre (*Arce*).—COLOMBIA.

Specimens from Colombia agree closely with the plate in Humboldt and Bonpland's work¹, Central-American examples showing several points of slight variation. The light markings on the primary wings are broader and more confluent in northern specimens, and the secondaries are more uniformly suffused with fulvous, the central portion of the latter in southern examples being semidiaphanous.

Were these points of distinction constant we should feel disposed to separate the Central-American specimens specifically from those of Colombia; but the former show that in Veraguan and Costa-Rican examples there is an indication of the peculiarities exhibited in Colombian ones, and we also see that the more northern the locality whence individuals have been procured the greater the density of the colouring of the secondary wings. Constant characters therefore fail whereby to distinguish these incomplete races; for this reason we are unable to admit Mr. Distant's *I. albescens*⁴ as a distinct species.

Ituna lamirus, though widely distributed, is nowhere very abundant, being found in mountain-valleys about 2000 or 3000 feet above the sea. It appears to be absent from the low-lying land of Panama; but, according to Dr. Boisduval, it is found in Nicaragua³.

LYCOREA.

Lycorea, Doubleday, Gen. Diurn. Lep. i. p. 105 (1847).

Subcostal of primaries emitting two branches before the end of the cell.

This genus, though nearly related to *Danaïs*, may easily be distinguished from it by the absence in the male of the peculiar patch on the submedian nervure of the secondary wings which distinguishes the members of the genus *Danaïs*, and by other characters. In possessing tufts of hairs at the extremity of the abdomen, however, its close relationship to *Danaïs* is shown.

Doubleday placed the genus in the family Heliconiidae; but this view is no longer tenable, as Mr. Bates's researches have proved (Trans. Linn. Soc. xxiii. p. 517).

The genus is a purely neotropical one. The Central-American representative has a wide range over the northern parts of South America. The definition of the members of the genus is by no means well marked, and some of the species may prove to be of merely nominal value.

1. *Lycorea atergatis*.

Lycorea atergatis, Doubl. & Hewits. Gen. Diurn. Lep. t. 16. f. 1¹; Boisd. Lép. de Guat. p. 27²; Butler & Druce, P. Z. S. 1874, p. 330³.

Alis nigris, fasciis duabus longitudinalibus fulvis, una cellulari, altera venam medianam extus sequente, macula cellulari subquadrata, duabus inter ramos medianos lacrymiformibus et tribus subapicalibus ochraceis; secundariis stria discali alteraque submarginali fulvis, et margino nigro maculis albis notato: subtus ut supra, primariis maculis apicalibus albis notatis.

Hab. MEXICO, Oaxaca (*Fenochio*), Cordova (*Kümeli*); GUATEMALA, Dueñas, Rio Motagua, Choctum, Rio Polochic (*F. D. G. & O. S.*); HONDURAS², San Pedro (*G. M. Whitely*); NICARAGUA (*Bridges, Janson, Belt*); COSTA RICA (*Van Patten*³); PANAMA, Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—VENEZUELA; COLOMBIA; ECUADOR; PERU; UPPER AMAZON and MARANHAM.

Though subject to slight variation, the members of this species found in particular districts are not, in our opinion, separable as distinct races. In specimens from Eastern Peru, the yellow spots at the apical half of the anterior wing are reduced to five small ones (four of which constitute the subterminal row), and a narrow fulvous line between the first and second median branches. The normal yellow spot at the extremity of the cell is fulvous; and the lower band on the posterior wings is obsolete towards its inner end.

These specimens show the most abnormal coloration of our series; but others approach them, the chief variation consisting in the yellow spots between the second and third branches of the median nervure of the anterior wings being confluent or not.

Its nearest ally appears to be *L. halia*, Hübn., of Brazil, of which it is a northern race, the two being found together at Maranham. Another close ally, *L. cleobæa* (Gdt.), occurs in the island of Haiti. The Guiana forms, *L. pasinuntia* (Cr.) and *L. ceres* (Cr.), differ rather more decidedly in the distribution of the yellow markings of the anterior wings.

Group ITHOMIINA.

Males without anal tufts; basal joint of palpi long; front leg of female not club-shaped; secondary wings with one or more tufts of hair near the subcostal nervure*.

* These tufts are usually only present in the male; but in *Methona* they exist in both sexes.

A. *Front leg of male with a well developed tibia and a tarsus always present.*

OLYRAS.

Olyras, Doubleday, Gen. Diurn. Lep. i. p. 107 (1847).

Femur of front legs of male longer than coxa, tibia and tarsus together longer than femur; subcostal pencil of hair of secondaries of male in a single patch, costa of secondaries abruptly arched, middle discocellular bent to an acute angle in the middle, where the recurrent nervule is emitted.

This genus, though having a strong general resemblance to *Ituna*, really belongs to the section of the *Danainæ* which contains the genus *Ithomia* and its allies—the secondary wings in the male having a costal tuft of hair, the abdominal tufts of *Danaïs* and its allies being absent. Five members at present constitute the genus, two of which are peculiar to Central America, one is common to Central America and Colombia; Venezuela and Ecuador have each a peculiar species. All the species seem to affect mountain-regions, some being found as high as 7000 or 8000 feet.

1. *Olyras theon*. (Tab. I. fig. 2.)

Olyras theon, Bates, Ent. Month. Mag. iii. p. 50¹.

Alis anticis fusco-nigris, stria longitudinali venam medianam occupante fulva, fasciis tribus subhyalinis arcuatis venis divis in dimidio apicali; posticis fulvis, extus nigro marginatis: subtus pallidior, alis ambabus margine externo albo punctulatis; posticarum costa nigra, maculis tribus magnis albis notata, area interna albicante.

Hab. MEXICO (*Sallé, Mus. Brit.*); GUATEMALA (*F. D. G. & O. S.*¹), San Gerónimo, Rio Polochic (*Hague*).

This species was described by Mr. Bates from a single specimen obtained by us in Guatemala in 1862; unfortunately the record where we captured it was lost, and the specimen, from its likeness to *Ituna lamirus*, was for some time not recognized as distinct from that species. We have little doubt, however, that it was caught in the vicinity of San Gerónimo, in the department of Vera Paz, Guatemala, where we made considerable collections, and whence Mr. Hague subsequently transmitted more examples. The same gentleman's collectors in the valley of the Rio Polochic also met with it. The Mexican specimen in the British Museum, obtained by M. Sallé was doubtless from the southern and more tropical portion of the Republic.

Our figure is taken from a male specimen captured by Mr. Hague near San Gerónimo.

2. *Olyras montagui*.

Olyras montagui, Butl. Trans. Ent. Soc. 1870, p. 490¹; Lep. Ex. p. 138, t. 50. f. 1²; Butl. & Druce, P. Z. S. 1874, p. 331³.

O. theoni similis, sed alis anticis nigricantioribus fasciis in dimidio apicali clarioribus, stria venæ medianæ fere obsoleta; posticis medialiter rufescentioribus, fascia mediana irregulariter hyalina: subtus maculis posticarum costalibus duabus albis.

Hab. COSTA RICA (*Van Patten*³), Irazu (*Rogers*); PANAMA, Chiriqui (*Arcé*).—COLOMBIA (*Mus. Brit.*²).

The original specimen, now in the British Museum, described and figured by Mr. Butler, is said to have been obtained in Colombia. This example has a semitranslucent patch on the secondary wings, which is hardly shown in our Central-American examples. These, on the other hand, have indications of a fulvous streak along the region of the median nervure of the primaries not observable in the original *O. montagui*; on the underside there is a single large white spot near the costal margin of the secondary wings a little beyond the cell.

3. *Olyras insignis*. (Tab. I. fig. 1.)

Olyras insignis, Salv. Ann. & Mag. Nat. Hist. ser. 4, iv. p. 163¹; Butl. & Druce, P. Z. S. 1874, p. 331².

Alis anticis nigris, maculis duabus discalibus, duabus elongatis angulum analem versus et apicibus interne (venis divis) flavo-hyalinis; posticis flavo-hyalinis nigro late marginatis, margine nigro angulum analem versus rufo notato: subtus margine externo albo-punctato, macula unica costali alba.

Hab. COSTA RICA (*Van Patten*²); PANAMA, Calobre (*Arcé*¹).

This well-marked species differs from all its congeners, except, perhaps, *O. translucens* of Ecuador, in having the intervals between the dark markings of the wings transparent, with only a tinge of yellow suffused over them. It was originally described from a single specimen obtained near Calobre in the State of Panama; but other specimens have since been secured. It appears to be more abundant in Costa Rica. Our figure represents the type specimen.

EUTRESIS.

Eutresis, Doubleday, Gen. Diurn. Lep. i. p. 111 (1847).

Femur of front leg longer than coxa; tibia and tarsus together longer than femur; subcostal pencil of hair of secondaries in a single patch; costa of secondaries uniformly curved; middle discocellular straight; recurrent nervule emitted from lower discocellular near the origin of the lower radial.

This small genus, comprising four species, has much the same range as *Olyras*, but in Central America does not spread north of Costa Rica. Of the species in South America, one, the type (*E. hyperia*), is confined to Venezuela; a second, *E. hyspa*, is

found in the mountainous parts of Eastern Ecuador; while the last, *E. imitatrix*, originally obtained in Eastern Peru, extends its range into South-eastern Ecuador. These four species are all very closely allied to one another; but the differences seem strictly associated with the areas where the insects are found.

1. **Eutresis theope.** (Tab. I. fig. 3.)

Eutresis theope, Godm. & Salv. P. Z. S. 1877, p. 60¹.

Eutresis hyperia, Staud. Verh. k.-k. zool.-bot. Ges. Wien, 1875, p. 96 (nec Doubl.)².

Alis anticis fusco-nigris, area interna hyalina, venis et linea irregulari submarginali divisa, macula triangulari discali fusca, area venæ medianæ fulva; posticis fulvis fusco marginatis area interiore hyalina, venis fulvis divisa: subtus velut supra, anticarum apicibus et posticarum marginibus albo punctatis.

Hab. COSTA RICA (*Van Patten*), Irazu (*Rogers*¹); PANAMA, Chiriqui (*Ribbe*²).

Though several specimens of this species were contained in Van Patten's Costa-Rica collection, described by Messrs. Butler and Druce (P. Z. S. 1874, p. 330), no mention of it is made in their paper. Dr. Staudinger refers to it as having been obtained by Ribbe in the vicinity of Chiriqui, when describing *E. imitatrix*. A fair series of specimens, including all four species, enabled us to discriminate *E. theope* from the Venezuelan *E. hyperia*; and subsequent examination of a still larger series has tended to show that the characters we pointed out are constant. Our figure is taken from one of Van Patten's Costa-Rica specimens.

TITHOREA.

Tithorea, Doubleday, Gen. Diurn. Lep. i. p. 99 (1847).

Femur of front legs of male longer than the coxa, tibia and tarsus together longer than the femur; pencil of hair on costal area of secondaries in two patches.

In addition to these characters, *Tithorea* may be easily recognized by its triangular primaries and pointed apex. The secondaries are also very round. The front legs of the female seem to be more nearly perfect than in any genus of this group; in one specimen we examined the claws were well developed, and, except for the smallness of their size, these legs were in no way atrophied. The genus has a wide range in tropical America, being absent, however, from South-eastern Brazil. Some of the most remarkable of the species are found in Colombia; and nearly all, including the most aberrant in coloration, are imitated by species of *Heliconius* found with them. Five species occur in Guatemala belonging to two forms, one of which is represented by two, the other by three races.

1. **Tithorea duenna.** (Tab. II. fig. 7.)

Tithorea duenna, Bates, Ent. Month. Mag. i. p. 56¹.

BIOL. CENT.-AMER., Rhopal., Vol. 1, Sept. 1879.

Alis anticis nigris, maculis duodecim flavis in dimidio apicali irregulariter positis, regione venæ medianæ fulvo notata; posticis ferrugineis nigro-marginatis, striaque transversa ab angulo apicali marginem internum versus transeunte nigra, ciliis alarum albo maculatis: subtus ut supra sed dilutiore, alis marginibus maculis duplicibus albis notatis; antennis nigris; prothorace rufo.

Hab. MEXICO (*Sallé*); GUATEMALA, Dueñas (*F. D. G. & O. S.*¹), Polochic valley (*Hague*).

This species seems restricted in its range to Southern Mexico and Guatemala, its place being taken by *T. pinthias* in the more southern parts of Central America. Though not common at Dueñas, where we first met with it, it would appear to be abundant in the valley of the Polochic in Vera Paz, whence Mr. Hague has sent us many specimens. It has a considerable range in altitude, as we took specimens in the woods near Dueñas as high as 5000 feet above the sea.

Our figure is taken from one of the types (female) caught near Dueñas.

2. *Tithorea pinthias*. (Tab. II. fig. 8.)

Tithorea tarricina, Bates, P. Z. S. 1863, p. 243 (nec Hew.)¹.

Tithorea duenna, Butl. & Druce, P. Z. S. 1874, p. 335 (nec Bates)².

Tithorea pinthias, Godm. & Salv. Ann. & Mag. Nat. Hist. ser. 5, ii. p. 259³.

T. duennæ affinis, sed alarum anticarum stria longitudinali fulva et posticarum stria transversa nigra caret; prothorace nigro nec rufo quoque distinguenda.

Hab. NICARAGUA, Chontales (*Belt*²); COSTA RICA (*Van Patten*²), Caché (*Rogers*³); PANAMA, Chiriqui (*Ribbe*), Calobre (*Arcé*³), Lion Hill (*M^cLeannan*¹).

This form entirely replaces *T. duenna* in Central America between Nicaragua and Panama, being common everywhere, except perhaps at Panama, whence but few examples have reached us.

Both *T. pinthias* and *T. duenna* belong to a small group of *Tithorea* consisting of four species, *T. tarricina* and *T. hecalesina* being the other two. The latter are found in Colombia, and are distinguished by the extent of yellow shown on the secondary wings, *T. hecalesina* having a large amount of this colour. At least three species of *Heliconius* have the pattern of three corresponding species of *Tithorea* of this group. *Heliconius octavia* is found with *Tithorea duenna* in Guatemala, *H. formosus* with *T. pinthias* in Costa Rica and the countries adjoining, and *H. hecalesia* with *T. hecalesina* in Colombia. The peculiarities of each *Tithorea* are shown by each *Heliconius* in the respective countries in which they are found with great precision.

The specimen figured is a female from Calobre, Panama.

3. *Tithorea helicaon*, n. sp.

Tithorea irene, Butl. & Druce, P. Z. S. 1874, p. 335 (nec Drury)¹.

I. irenæ affinis, sed alis anticis maculis flavis majoribus, cellula anticarum ad basin et regione venæ medianæ

lineis fulvis bene notatis, margine posticarum angustiore nigro et maculis extra cellulam nigris absentibus diguoscenda.

Hab. COSTA RICA (*Van Patten*¹).

Of this race we have four examples, all agreeing so closely with one another that we have little doubt that they represent the prevalent form of *T. irene* found in Costa Rica.

4. *Tithorea hipphous*, n. sp. (*T. irene*, Tab. II. fig. 9.)

T. irene affinis, sed alis anticis ut in *T. helicaone* diversa; posticis sicut in *T. irene*, et ab *T. helicaone* sic differt.

Hab. GUATEMALA, San Gerónimo (*Hague*); SAN SALVADOR (*Mus. Staudinger*).

A single male specimen from Guatemala is in our possession, having been sent us by Mr. Hague from the neighbourhood of San Gerónimo. We have also seen examples from San Salvador, lent us by Dr. Staudinger; and from one of these our figure is taken. In these the secondaries have a more fully developed black band than in the Guatemalan specimen; but they do not otherwise differ in any important character.

5. *Tithorea irene*. (Tab. II. fig. 10.)

Papilio irene, Drury, Ill. Ex. Ent. iii. t. 38. f. 1¹.

Tithorea umbratilis, Bates, Ent. Month. Mag. iii. p. 86².

♀. Alis anticis nigris, maculis tredecim flavis in dimidio apicali positis, una irregulari ad cellulæ finem (cum altera minuta extra cellulam vix disjuncta), quatuor linea arcuata ultra eam, quatuor linea obliqua sub-apicali et tribus submarginalibus ad angulum analem; posticis fulvis nigro marginatis et maculis duabus extra cellulam nigris notatis: subtus ut supra, sed posticarum costa fulva marginibusque externis albo punctulatis: antennis flavis ad basin nigris.

Hab. PANAMA, Lion Hill (*M. Leannan*²).

Drury states that he received his *Papilio irene* from Jamaica¹; and a like origin is given for the three other butterflies figured on the same plate. As all these other species have been found on the mainland of South America in the neighbourhood of the isthmus of Panama, and as none of them are known as inhabitants of Jamaica, we are probably justified in considering Panama as the probable origin of *T. irene*. This view is supported by the fact that the insect which agrees best with Drury's figure is a single female example from Panama, which Mr. Bates described as *T. umbratilis*². The only traceable difference is in the indications of rufous marks at the base of the primaries of Drury's figure, and the presence of yellowish spots near the apex of the secondaries, variations perhaps to be attributed to a difference of sex between our specimen and that figured by Drury, the latter being a male. *T. taricina*, Hew. (Ex. Butl. *Tith.* & *Hel.* t. iv. f. 1), has a close resemblance to *T. irene*; but

the wings being less elongated, and the yellow spots at the apex of the secondaries well defined, show a stronger relationship to *T. hecalesina*, Felder, and its allies.

We have been for a long time disposed to consider the more northern representatives of *T. irene* as incomplete races of that insect; but a further examination of the subject with additional materials reveals the fact that an apparently well-marked race inhabits Costa Rica, and another Guatemala and San Salvador. These we have described above under distinct names, and given their differential characters. We are at the same time aware that the subject of the variation of the *T. harmonia* group of this genus is by no means well worked out; but we think that whatever course is taken with the various forms of the southern butterfly, *T. irene* will be kept distinct from *T. harmonia*.

We have figured the type of *T. umbratilis* from Panama.

MELINÆA.

Melinæa, Hübner, Verz. bek. Schmett. p. 11 (1816), partim; Bates, Trans. Linn. Soc. xxiii. p. 549 (1862).

Femur of front legs of male half the length of the coxa, tibia and tarsus together not longer than the femur; pencil of hair on costal area of secondaries in two patches.

Mr. Bates was the first to define the proper limits of the genus *Melinæa*, which by all previous writers and by some subsequent ones has been confounded with *Mechanitis*, from which it differs in several important particulars, to which attention is drawn in Mr. Bates's paper. The number of known species of the genus is about thirty, which are distributed over the whole of the tropical portions of the South-American continent, the greater number of species being found throughout the region of the Upper Amazon and eastern slopes of the Andes. Four species are included within our limits, one of which, however, is barely of specific value.

1. *Melinæa scylax*. (Tab. II. fig. 12.)

Melinæa scylax, Salv. Ann. & Mag. Nat. Hist. ser. 4, vii. p. 412¹; Butl. & Druce, P. Z. S. 1874, p. 335².

Melinæa ribbei, Weym. Stett. ent. Zeit. 1875, p. 379, t. 2. f. 4³; Staud. Verh. z.-b. Ges. Wien, xxv. p. 97⁴.

Alarum anticarum dimidio apicali nigro, fascia obliqua, maculis tribus apicalibus et una in angulo anali flavis, dimidio basali fulvo, macula discali nigra; posticis fulvis margine externo anguste nigro: subtus pagina superiore concolori, posticarum basi flava.

Hab. COSTA RICA (*Van Patten*²); PANAMA, Chiriqui (*Arcé*¹, *Ribbe*³, *Zahn*).

Of this distinct species specimens were first sent us from the neighbourhood of Chiriqui, about the year 1870, both by Arcé and Zahn; and from the same district Herr Ribbe appears to have found it in some abundance a few years later^{3 4}. Specimens were contained in Van Patten's collection from Costa Rica², which country seems to be the northern limit of the range of this species. Its most obvious

distinction from *M. imitata* is the absence of the median band on the secondaries of that species. The *Heliconius* having a similar pattern to *M. scylax* is *H. clarescens*, Butl.

We have figured the type specimen, a male, taken near Chiriqui.

2. *Melinæa parallelis*.

Melinæa parallelis, Butl. Cist. Ent. i. p. 155¹.

Alis anticis nigris, basi fulvis, fasciis quatuor maculis albis compositis in dimidio apicali, proxima per cellulam ad angulum analem transeunte, ultima apicem occupante; posticis fulvis, margine externo et fascia lata mediana nigris: subtus ut supra, margine posticarum albo maculato et fascia subcostali (fasciæ longitudinali conjuncta) nigra.

Hab. PANAMA¹, Chiriqui, Calobre (*Arcé*), Lion Hill (*M^cLeannan*).

A close ally of *M. messatis* (Hew.), but differing in the black band of the secondaries passing completely across the wings, in *M. messatis* this band being incomplete and not reaching the abdominal margin. Mr. Butler's description was taken from a duplicate from one of M^cLeannan's collections. The *Heliconius* corresponding in colour to *M. parallelis* is *H. fasciatus*, nob.

3. *Melinæa lilis*.

Mechanitis lilis, Doubl. & Hew. Gen. Diurn. Lep. i. t. 17. f. 4¹.

Alis anticis nigris dimidio basali (nisi margine interno et maculis duabus una discali, altera inter ramos medianos primum et secundum, fulvis), dimidio apicali fasciis duabus flavis fulvo marginatis, una extra cellulam obliqua, altera apicali ex maculis quatuor composita; posticis fulvis, margine externo et fascia mediana nigris: subtus ut supra marginibus externis albo maculatis; posticis fascia subcostali nigra fasciæ longitudinali conjuncta.

Hab. PANAMA, Lion Hill (*M^cLeannan*); VENEZUELA¹.

A single specimen from the Panama railway has the characteristics of this Venezuelan form, which here appears probably at the limit of its range in this direction. There is apparently a gap in the Isthmus where no *Melinæa* of this form is found, as none have reached us from any point between the Panama railway and Costa Rica, the gap being filled by *M. scylax*. This, perhaps, is an additional argument in favour of *M. imitata* being a distinct species.

4. *Melinæa imitata*. (Tab. II. fig. 11.)

Melinæa imitata, Bates, Ent. M. Mag. i. p. 55¹.

Melinæa tachypetis, Feld. Reise d. Nov., Lep. p. 355².

Melinæa lilis, Butl. & Druce, P. Z. S. 1874, p. 334 (nec Doubl.)³.

M. lili valde similis, sed macula alarum anticarum discali et macula intra ramos medianos primum et secundum conjunctis fasciam indivisam constituentibus, marginibus quoque fulvis fasciarum anticarum apicalium flavarum absentibus.

Hab. MEXICO² (*Sallé*, Doubl. & Hew.), Mts. Oaxaca (*Fenochio*); GUATEMALA, Retalhuleu, Polochic valley (*O. S. & F. D. G.*¹); NICARAGUA, Chontales (*Belt*, *Janson*); COSTA RICA (*Van Patten*³, *Rogers*).

Mr. Bates, in describing this species from specimens obtained by us in Guatemala in 1862, compared it with *Melinæa messatis*, Hew.; but its nearest ally is undoubtedly *M. lilis*, Doubl. & Hew., to which Messrs. Butler and Druce referred it³. So close is it to that species that its difference from it may well be questioned. The most noticeable points of distinction consist in the inner of the two bands of yellow spots on the primaries being purer in colour instead of tinged with tawny as in *M. lilis*. The discocellular dark band of the primaries runs between the first and second median branches uninterruptedly, and in many cases is joined to the black of the outer margin. In *M. lilis* this band is almost always broken up into spots. These differences assume a higher value than at first appears, seeing that they are found also to some extent in *Heliconiæ* inhabiting the same localities (*H. metalilis*, Butl., of Venezuela, and *H. telchinia*, Doubl., of Central America). Mexican specimens of *M. imitata* were described by Dr. Felder as *M. tachypetis*; but an example from Oaxaca differs in no way from our Guatemalan types, with which also Costa-Rican specimens agree.

In Guatemala this species appears restricted to the hot forests of the lowlands; none of our specimens were obtained at a higher elevation than a thousand feet.

We have figured one of the types, a male, from the valley of the Rio Polochic.

B. *Tibia of front leg of male reduced to a knob at the end of the femur; tarsus either altogether absent, or barely distinguishable at the end of the tibial knob.*

a. Femur of front leg of male much shorter than the coxa.

SCADA.

Mechanitis, section *Oleria*, Hübn., Bates, Trans. Linn. Soc. xxiii. p. 529.

Scada, Kirby, Syn. Cat. Diurn. Lep. p. 23 (1871).

Terminal joint of palpi almost obsolete; costal and subcostal nervures of secondaries of male close together; lower radial directed forwards.

The members of this small genus were placed by Mr. Bates as a section of the genus *Mechanitis*, with which no doubt they have considerable affinity. The section, however, seems sufficiently definite to admit of being treated as a separate genus; and as such it was placed by Mr. Kirby. As Mr. Bates did not employ *Oleria* in a generic sense, and as *Oleria* of Hübner contains none of these insects, Mr. Kirby was, we think, justified in proposing the new name *Scada* for them. The genus consists of about ten species, distributed over the greater part of Tropical America from Brazil to Costa Rica.

1. *Scada xanthina*. (Tab. III. fig. 2.)

Ithomia (Oleria) xanthina, Bates, Ent. M. Mag. iii. p. 52¹.

Scada xanthina, Kirby, Cat. p. 23²; Butl. & Druce, P. Z. S. 1874, p. 334³.

Alis flavis subhyalinis, marginibus (punctis albis notatis) et fascia obliqua cellulae terminum transeunte nigris; subtus velut supra sed paulo pallidior.

Hab. COSTA RICA (*Van Patten*³), Irazu (*Rogers*); PANAMA², Calobre (*Arcé*), Lion Hill (*M^cLeannan*¹).

Mr. Bates in his original description compares this species with the Brazilian *S. gazoria* (Godt.), and with *S. zemira* (Hew.), of Ecuador; but its nearest ally seems to us to be *S. zibia* (Hew.), of Ecuador, from which it differs in the greater extent and brighter colour of the yellow of both wings. Its range seems restricted to the isthmus of Central America between Costa Rica and Panama. Colombian and Venezuelan examples of this form, though certainly very similar to *S. xanthina*, approach more nearly to the Ecuadorean *S. zibia*. The original types of this species were sent us by the late James M^cLeannan from his station on the Panama Railway, Lion Hill; but we have figured a male from Calobre in better condition.

AERIA.

Aeria, Hübner, Verz. bek. Schm. p. 9 (1816).

Ithomia, section 3, *Aeria*, Doubleday, Gen. Diurn. Lep. i. p. 126.

Terminal joint of palpi small; costal and subcostal nervures of secondaries of male wider apart than in *Scada*; lower discocellular directed backwards.

This small section has similar front legs to *Scada*, and therein differs from all other *Ithomiæ* except *Sais*. There are about four or five species of this form, which seem subject to certain local variations. They are found from Brazil to Guatemala.

1. *Aeria agna*, n. sp. (*Ithomia eurimedia*. Tab. III. fig. 12.)

Ithomia agna, Doubl. Gen. Diurn. Lep. p. 127 (descr. nulla)¹.

Scada? *eurimedia*, Butl. & Druce, P. Z. S. 1874, p. 334 (nec Cramer)².

Alis nigris, anticis fascia subtriangulari a basi per cellulam fere ad angulum analem extensa et altera obliqua subapicali citrinis; posticis fascia eodem colore longitudinali alam mediam occupante; prothorace et alarum tectricibus rufis: subtus sicut supra sed margine alarum externo punctis albis ornato.

Hab. NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*²); PANAMA, Chiriqui (*Ribbe, Mus. Staudinger*), Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—COLOMBIA; VENEZUELA¹.

A close ally of *A. eurimedia* (Cr. Pap. Ex. t. 126. figs. C, D), but differing from that species in the brighter colour of the citron marks of the wings, in the narrower median citron band of the secondaries, and in the absence beneath of the rufous marks in the black submarginal borders of both wings. It is a common species on the Isthmus of Panama, and thence northwards as far as Nicaragua. In Guatemala its place is taken by *A. pacifica*, which differs from it in having rufous marks in the black

margin of the secondaries beneath, just as in *A. eurimedia*. Southward of the Isthmus precisely similar specimens occur in Colombia, where, however, it is probably found only on the northern coast, in the great valley of the Magdalena and in Venezuela. Its presence in the latter country enables us to bestow upon it the name proposed by Doubleday for it more than thirty years ago¹.

We have figured a male from Panama.

2. ***Aeria pacifica***, n. sp. (*Ithomia eurimedia*. Tab. III. figg. 10, 11.)

A. agnæ simillima, sed alarum marginibus nigris, subtus medialiter rufo notatis.

Hab. GUATEMALA, Quirigua, Polochic valley, Retalhuleu (*F. D. G. & O. S.*).

In arranging our collections after our return from Central America in 1863, Mr. Bates distinguished this insect as a variety of *A. eurimedia* under the above name. Since then the receipt of additional specimens of it, and also of the more southern race, leads us to believe that the brighter citron colour of the markings of the wings, and the narrowness of the median band of the secondaries, are constant characters by which it may be distinguished from *A. eurimedia*, and that the rufous marks in the black margins of the secondaries beneath distinguish it without fail from its near neighbour *A. agnæ*.

We found this species common in September in the forest in which the Indian ruins of Quirigua are situated; but it was still more abundant in the same month in the cocoa-plantations in the outskirts of the village of Retalhuleu, which lies on the Pacific side of the Cordillera, at the foot of the mountains, about 900 feet above the ocean.

Our figure is taken from a male specimen captured in the valley of the Rio Polochic below the village of Tucuru.

b. Femur of front leg of male as long as or longer than the coxa.

THYRIDIA.

Thyridia, Hübner, Verz. bek. Sehmett. p. 9 (1816); Zutr. ex. Sehmett. ff. 163, 164 (1818); Doubl. & Hew. Gen. Diurn. Lep. p. 117 (1847).

Aprotopos, Kirby, Cat. p. 19.

Tarsus of female with four joints; a pair of spurs on the third joint only.

Great difficulty surrounds the correct application of this name. Hübner, in first introducing it, associated together *T. themisto*, Hübn., *Papilio psidii*, Linn., and *P. ilione*, Cr. *T. themisto* Hübner figured in his 'Zuträge;' the figure, as usual, is so good that no doubt whatever exists as to what species he represented. This species was afterwards selected by Doubleday and Hewitson as the type and only representative of the

genus *Methona*. *Papilio ilione* of Cramer, about which also there is no uncertainty, became a member of the genus *Ituna*. The sole representative left in Hübner's genus is *Papilio psidii* of Linnæus. It remains to determine what this species is.

Writers have usually been content to take Cramer's interpretation of the Linnean name; but to get at a correct conclusion Linnæus alone must be his own interpreter. Turning to the 'Museum Ludovicæ Ulricæ,' we find a reference to Madam Merian's 'Insects of Surinam' (t. 19); and this we consider to give the best clue to what the Linnean species was. It will be observed in this figure that the secondaries possess a submarginal row of white spots, pointing exclusively to the insect usually known as *Thyridia ino*, Feld. Hence the type of *Thyridia* is *T. ino* (= *Papilio psidii* of Linnæus). Cramer's figure, as Mr. Bates justly says, appears to us to represent a *Methona*, notwithstanding the opinion of Messrs. Butler and Druce to the contrary; but we disagree with Mr. Bates in considering it to be the Linnean species. If Mr. Bates's view were correct, *Thyridia themisto*, Hübn., and *P. psidii*, Linn., would be congeneric, and should both be placed in the genus *Thyridia*, Hübn., including *Methona* of Doubleday and Hewitson as a synonym. A new generic name would thus become necessary for *Thyridia ædesia* and its allies. This is Mr. Kirby's view, who proposed the name *Aprotopos* to supply the want. By keeping *P. psidii*, Linn., in the genus *Thyridia* this difficulty is obviated. The conclusions we come to are practically the same as those arrived at by Messrs. Butler and Druce, though our reasons are not identical.

Thyridia, as thus interpreted, has a wide range in tropical America, extending from Southern Brazil as far north as Nicaragua. Four species are included within this area, only one of which occurs in Central America.

1. *Thyridia melantho*. (Tab. I. fig. 4.)

Thyridia melantho, Bates, Ent. M. Mag. iii. p. 50 (1866)¹; Butl. & Druce, P. Z. S. 1874, p. 331².
Aprotopos melantho, Kirby, Cat. p. 20³.

Alis anticis nigris, maculis duabus intra cellulam, proxima indistincta, macula subapicali venis divisa, altera submarginali subrotunda inter ramos medianos secundum et tertium et una subquadrata ad angulum analem ochraceis; posticis fulvis nigro marginatis, puncto ad terminum cellulæ nigro: subtus, velut supra, margine serie punctorum minorum alborum notato.

Hab. NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*²); PANAMA, Chiriqui (*Arcé, Zahn*), Lion-Hill station (*M'Leannan*¹).

This species was originally described from a single specimen sent us by the late James M'Leannan from his station on the Panama railway. As no other example has reached us from the same locality, it would appear that this point is probably near the southern limit of the range of the species. None of Arcé's collections formed in the vicinity of Santiago de Veraguas contained examples; but numerous specimens have been sent from the Pacific slope of the Volcano of Chiriqui; and from this

district northwards to Chontales, in Nicaragua, *Thyridia melantho* must certainly be very abundant.

A little variation exists between individuals of this species: in some examples the proximal discocellular spot of the primaries is almost obsolete; in others the distal spot is scarcely visible, the whole basal half of the wing being nearly uniform black; in one specimen from Chiriqui the black apical angle of the secondaries embraces the black spot at the end of the cell. The nearest ally to *T. melantho* is undoubtedly *T. ædesia*, which takes its place in the northern portion of the southern continent, being abundant in the neighbourhood of Santa Marta and the western provinces of Venezuela.

Our figure is taken from the type specimen (a male) sent us from Panama.

MECHANITIS.

Mechanitis, Fabricius, Ill. Mag. vi. p. 284 (1807); Doubl. & Hew. Gen. Diurn. Lep. p. 128; Bates, Trans. Linn. Soc. xxiii. p. 528.

Tarsus of front legs of female with four joints, a pair of spurs on each of the second and third joints; primaries with recurrent nervule on lower discocellular; secondaries with recurrent nervule on middle discocellular; costal nervure of secondaries of female anastomosing with subcostal about the middle of the costal margin of the cell; cell of secondaries not extending nearly to the apical angle.

Five tolerably well-marked races of this genus are found in Central America, all of which have received names; but an examination of a large series of these insects, we think, shows that, though in certain districts particular forms prevail, specimens are not wanting tending to link most if not all of them together. In fact we find that the representatives of *Mechanitis* in Central America present the same features as regards their variation as those possessed by the insects found in the valley of the Amazons, so fully discussed by Mr. Bates in his paper in the 'Transactions of the Linnean Society.'

The geographical distribution of these different races in Central America is an instance of how races may be nearly, but not absolutely, confined to particular localities. *M. doryssus*, by far the most widely distributed of them all, attains its maximum development in Guatemala, where it is most abundant. It is found in Mexico, where it is the sole representative of the genus; towards the isthmus of Panama it becomes quite rare, its place being taken by *M. macrinus*. It then reappears in a slightly modified form in the northern portions of South America.

M. lycidice is also abundant in Guatemala, but becomes rare in the southern portions of the isthmus, its place being taken by *M. isthmia*, a race from which it is but imperfectly segregated, an almost complete series of intermediate steps being found to connect the extreme forms. The well-marked yellow cross band seen in many indivi-

duals of *M. lycidice* shows its relationship to *M. lysimnia*, a species inhabiting the eastern coasts of South Brazil, and is thus an instance of the similarity to be traced in races and species found inhabiting these widely-separated localities.

M. isthmia is rarely found beyond the isthmus of Panama and as far north as Costa Rica; we have, however, a single specimen of *M. lycidice*, from Guatemala, picked out of hundreds of the common form of that species, which has several characteristics of *M. isthmia*.

M. labotas appears to be confined to Panama, Costa Rica, and Nicaragua, no specimens from elsewhere having as yet come under our notice.

M. macrinus, though as common in the State of Panama as in Colombia, does not spread northward of Costa Rica.

1. *Mechanitis lycidice*. (Tab. I. figg. 7, 8.)

Mechanitis lycidice, Bates, Ent. M. Mag. i. p. 33¹.

Mechanitis doryssa, Boisd. Léop. Guat. p. 31 (nec Bates)².

Mechanitis isthmia, Butl. & Druce, P. Z. S. 1874, p. 334 (partim)³.

Mechanitis ovata, Dist. Proc. Ent. Soc. 1876, p. xi⁴.

Sexus quoad colores fere similes; alarum anticarum dimidio basali fulvo; posticarum margine anguste nigro, macula intra ramos medianos primum et secundum cum nigro alarum anticarum apicum confluento; anticarum dimidio distali nigro, maculis aut fasciis flavis trifasciato, fascia harum interna valde distincta; posticis fulvis fascia una longitudinali flava, altera nigra.

Hab. GUATEMALA, Retalhuleu, Dueñas, Motagua valley, Chuacus, Chisoy valley, Polochic valley (*S. & G.*¹ and *H. Hague*); HONDURAS, San Pedro (*G. M. Whitely*); NICARAGUA¹ (*Bridges*), Chontales (*Belt*); COSTA RICA (*Van Patten*^{3 4}, *Carmiol*), Caché, Irazu (*H. Rogers*).

In this race the extent of black on the primaries is variable, some specimens showing almost the dark colour of *M. isthmia*; the black band of the secondaries in the females varies considerably, in some being well defined, in others evanescent and reduced to a rudimentary band at the apical angle. The extent of the yellow band on the secondaries is also very variable, in some specimens being well defined, in others altogether wanting. In Guatemala, though individuals showing considerable variation are not wanting, this race has more constant characters than in Nicaragua and Costa Rica; here we find the influence producing *M. isthmia* becomes very apparent, and it would not be difficult to arrange a complete series of specimens connecting *M. lycidice* with the more southern race. To one of these intermediate forms Mr. Distant applied the name *M. ovata*⁴; but we do not see how its distinctness as a race can be maintained. We have no specimens from the southern continent agreeing accurately with *M. lycidice*; but two examples from Chanchamayo in Peru are certainly very closely allied. Dr. Boisduval², under the name *M. doryssa*, evidently describes this species. He gives Mexico as one of its habitats: it very probably occurs there; but we have seen no

specimens confirming his statement. We found this species usually associated with *M. doryssus* in Guatemala, near Dueñas (alt. 5000 ft.); both were very common in open woods, where they might be seen nearly the whole day flying a few feet from the ground.

Our figures and descriptions are taken from typical specimens; the male was captured at Choacus in the valley of the Motagua, the female in the valley of the Polochic.

2. *Mechanitis isthmia*. (*M. isthmicus*, Tab. I. figg. 11, 12.)

Mechanitis isthmia, Bates, P. Z. S. 1863, t. 29. f. 1¹; Butl. & Druce, P. Z. S. 1874, p. 334² (partim).

Sexus paulo dissimiles quoad fasciam posticarum longitudinalem nigram; alis anticis nigris macula basali fulva, fascia interna flava fere obsoleta; posticis fulvis fascia longitudinali nigra in mare bene distincta, in femina obsoleta aut omnino absente, posticarum margine anguste nigro.

Hab. COSTA RICA (*Van Patten*)², Irazu, Caché (*H. Rogers*); PANAMA, Chiriqui, Calobre (*Arcé*), Line of railway (*M^cLeannan*)¹.

In some specimens of this race the yellow spot at the end of the cell of the primaries is absent; in others it is ill defined; and in a few it is distinctly shown. The black longitudinal band on the secondaries of the females varies much, in some examples appearing as an incipient band at the apical angle; in others it is wanting altogether. This race is very abundant throughout the State of Panama, where its characters are fairly constant. In Costa Rica individuals are not wanting agreeing accurately with Panama specimens; with these, however, are a larger proportion of examples which vary in the direction of the more northern race, *M. lycidice*. From Guatemala we have a female specimen which has the dark primaries so characteristic of *M. isthmia*; but the secondaries have a well-defined longitudinal band, as in many examples of *M. lycidice*. This is one selected from hundreds of the Guatemalan form, to which undoubtedly it must be considered to belong; it shows, however, a tendency to assume the colour-pattern of a race geographically far removed from it, and proves that, though races are fairly constant in their respective areas, they are by no means absolutely so.

Our figures and descriptions are taken from Panama specimens, whence the types were procured.

A form, closely allied to *M. isthmia*, was described by Mr. Reakirt in 1865 as *M. californica*, from specimens sent him from Los Angeles in California (Proc. Ent. Soc. Phil. v. p. 223). The appearance of *Mechanitis* so far north is remarkable; and a confirmation of its presence in California would be acceptable, as the record of the occurrence of another Panama species, *Ithomia panamensis*, in the same paper, prompts the suggestion that some mistake may have been made in the locality assigned to them.

3. *Mechanitis doryssus*. (Tab. I. figg. 9, 10, & Tab. IV. fig. 2.)

Mechanitis doryssus, Bates, Ent. M. Mag. i. p. 33¹; Butl. & Druce, P. Z. S. 1874, p. 334².

Mechanitis utemaia, Reak. Pr. Ac. Phil. 1866, p. 241³.

Sexus fere similes; alarum anticarum fascia interna transversa fulva, prope costam tantum flava, fascia media et apicali flavis, fulvo interdum marginatis, macula intra ramos medianos primum et secundum bene distincta, posticarum margine late nigro.

Hab. MEXICO, Oaxaca (*Fenochio*); GUATEMALA, Retalhuleu, Dueñas, Chuacus, San Gerónimo, Chisoy valley, and Polochic valley (*F. D. G. & O. S.*¹); HONDURAS, San Pedro (*G. M. Whitely*); NICARAGUA (*Belt, Janson*); COSTA RICA (*Van Patten*²), Irazu, Caché (*H. Rogers*); PANAMA, Calobre (*Arcé*).

In the northern portion of South America, Colombia, and Venezuela this species is represented by a very closely allied race, if, indeed it really differs; it has, however, been separated by Mr. Butler under the name of *M. veritabilis*. In Costa Rica and Panama a large dark-coloured race not unfrequently occurs, a specimen of which we have figured on Plate IV. fig. 2. In it the light markings of the primaries are narrowed and the black colour extended; the tawny colour of both wings is of a deeper tint. These dark individuals, though common in the above districts, are not restricted to them; for we possess a Guatemalan specimen (a male), and a female Mexican example, which approach them very closely in intensity of colour as well as size. Our Honduras specimen is a male, doubtless that of *M. utemaia*, Reak.³ It agrees with Guatemalan examples of *M. doryssus*; and we believe it to belong to that species.

In Guatemala we found this *Mechanitis* in the woods near Dueñas, where it was exceedingly abundant.

Our figures and descriptions are taken from some of our original Guatemalan specimens; the male was captured at San Gerónimo, the female in the valley of the Polochic.

4. *Mechanitis labotas*. (Tab. IV. fig. 1.)

Mechanitis labotas, Distant, Proc. Ent. Soc. 1876, p. xii¹.

Mechanitis doryssus, Butl. & Druce, P. Z. S. 1874, p. 334 (partim)².

Sexus paulo dissimiles, quoad alarum posticarum fasciam longitudinalem nigram; anticarum fascia interna transversa fulva, prope costam tantum flava, fascia media et apicali flavis, fulvo interdum marginatis, macula intra ramos medianos primum et secundum valde distincta; posticarum fascia longitudinali nigra in mare valde distincta, in femina obsoleta.

Hab. NICARAGUA (*Belt*); COSTA RICA (*Gabb*¹, *Van Patten*²); PANAMA, Chiriqui (*Zahn*), Calobre (*Arcé*), Line of railway (*M. Leannan*).

The only character by which this race can be distinguished from its very near ally *M. doryssus* is the absence in the female of a continuous black band in the secondaries,

which is only shown in some specimens in a rudimentary state near the apical angle; in others it is absent altogether. Finding only females of this form in Costa Rica, we were for some time uncertain what the male was like; but on further consideration it became evident that the lighter-coloured specimens from Costa Rica, previously assigned to *M. doryssus*, were really the males of *M. labotas*. It seems to be a race as distinct in its characters as the others we here treat of; and as such we admit it.

The specimens described and the female figured are from Costa Rica.

5. *Mechanitis macrinus*. (Tab. I. figg. 5, 6.)

Mechanitis macrinus, Hew. Exot. Butt., *Mechan.* t. iii. f. 11¹; Butl. & Druce, P. Z. S. 1874, p. 334².

Sexus paulo dissimiles, quoad alarum posticarum fasciam longitudinalem nigram; alis anticis fascia lata per cellulam transeunte flava, fascia media obsoleta aut omnino absente, macula intra ramos medianos primum et secundum sæpe absente; posticarum margine lato nigro, fascia longitudinali nigra in mare valde distincta, in femina obsoleta.

Hab. COSTA RICA (*Van Patten*²); PANAMA, Calobre (*Arcé*), Line of railway (*M^cLeannan*). — COLOMBIA¹; ECUADOR; VENEZUELA.

The extent of the yellow cross band of the primaries is subject to variation, in some specimens being fairly defined, in others almost wanting, and in a few quite absent.

This is a common species in the northern part of South America, and appears equally common on the line of the Panama Railway; from there its numbers appear to diminish, as from Costa Rica but few examples have come under our notice.

Dr. Boisduval (*Lép. Guat.* p. 31) includes this species in his list of Nicaraguan Butterflies; but we have no corroborative evidence that it is found in that country.

Our figures and descriptions are taken from Panama specimens, the male from Calobre, the female from the line of railway.

CERATINIA.

Ceratinia, Hübner, Verz. bek. Schm. p. 10 (1816).

Ithomia, section iv. *Ceratinia*, Doubleday, Gen. Diurn. Lep. i. p. 127.

Ceratinia, Bates, Trans. Linn. Soc. xxiii. p. 523.

Tarsus of front leg of female with four joints, a pair of spurs on each of the second and third joints; primaries with recurrent nervule on upper discocellular; secondaries with recurrent nervule on lower discocellular; costal nervure of secondaries of female normal; cell of secondaries extending nearly to the apical angle.

This genus comprehends a number of species found throughout tropical America. Of these, seven come within our limits, most of them, however, from the more southern districts, as we have as yet seen but a single species of *Ceratinia* from Guatemala and none from Mexico.

1. *Ceratinia decumana*, sp. n. (Tab. IV. fig. 3.)

Napeogenes excelsa, Butl. & Druce, P. Z. S. 1874, p. 334 (nec Feld.)¹.

Ceratinia excelsa, var., Dewitz, Mitth. münch. ent. Ver. 1877, p. 87.

Alis anticis nigris, macula obliqua subquadrata per cellulam, fasciola subapicali venis divisa, duabus majoribus infra eam, et octo in margine externo seriatim positae flavido-hyalinis; posticis ferrugineis, limbo apicali nigro albo punctato, area venae medianae maris (nec feminis) obsolete pellucida: subtus sicut supra, area interna posticarum albicante.

Hab. COSTA RICA (*Van Patten*¹), Irazu, Caché, Rio Sucio, San Francisco (*Rogers*); PANAMA, Chiriqui (*Arcé, Ribbe*), Calobre (*Arcé*).

This species is undoubtedly very nearly allied to *Napeogenes excelsa*, Felder, from Colombia, which is admirably figured in the 'Voyage of the Novara' (Lep. t. 44. f. 13, ♂); but having now seen a large number of specimens both from Colombia and Central America, we are able to trace a constant difference between them. The conspicuous semitransparent band in the secondaries of both sexes of *C. excelsa* is only faintly perceptible in the male of *C. decumana*, and altogether wanting in the female. In this species the whole of the base of the primaries in both sexes is black, whilst the male of *C. excelsa* has the region of the median nervure fulvous.

C. decumana and its ally are almost the largest species of the section *Ceratinia*; and they both appear to be not uncommon in the regions to which they respectively belong. Our description and figure are taken from Costa-Rican examples in our collection.

2. *Ceratinia megalopolis*. (*Ithomia megalopolis*, Tab. III. fig. 8.)

Ithomia megalopolis, Feld. Voy. Nov., Lep. p. 360, t. 44. f. 9¹.

Alis anticis nigris, dimidio basali macula nigra ornato, intra eam fulvo, extra eam sulphureo-flavo, sinuato; maculis paucis exterioribus et serie submarginali sulphureo-flavis; posticis fulvis, margine externo et macula apicem versus valde irregulari nigris, hac punctulis flavis ornata: subtus sicut supra, posticis macula basali nigra et punctis submarginalibus albis ornatis.

Hab. PANAMA, Veraguas (*Arcé*), Lion Hill (*M. Leannan*); COLOMBIA¹.

We have several specimens from the State of Panama agreeing closely with Dr. Felder's figure¹. Considerable variation is observable in the amount of black near the apical angle of the secondaries: in some specimens there is an almost isolated black spot distinct from the black of the outer margin; in others the black is a large patch with an irregular inner edge; and in others there are indications of a band of black extending towards the abdominal edge. The distinction of *C. megalopolis* from *C. cleis* consists in the greater breadth of the median yellow patch on the primaries; but we are by no means certain that this difference is of specific value.

The specimen figured is a *female* from Lion Hill.

3. *Ceratinia cleis*. (*Ithomia cleis*, Tab. III. fig. 5.)

Ithomia (Ceratinia) cleis, Bates, Ent. M. Mag. i. p. 33¹.

Ceratinia mylassa, Druce, Ent. M. Mag. xii. p. 126².

C. megalopoli simillima, sed fascia trigona flava alarum medium anticarum occupante angustiore et macula nigra inter ramos medianos primum et secundum interrupta; posticis omnino ut in *C. megalopoli*.

Hab. PANAMA, Veraguas (*Arce*²), Lion Hill (*M^cLeannan*¹).

C. mylassa seems inseparable from this species, the difference apparently consisting of the reduction of the median yellow patch of the primaries into smaller spots than in *C. cleis*, and is thus a somewhat further departure from *C. megalopolis* than *C. cleis* is. But as no two of Mr. Druce's typical specimens are alike in this respect, and as the passage into *C. cleis* is almost perfect, *C. mylassa* cannot be distinguished with certainty. *C. cleis* is apparently by no means common in the State of Panama, where alone it has been found. Should it hereafter be found necessary to unite this species with *C. megalopolis*, as seems not improbable, the name the insect should bear is *C. cleis*. Its nearest ally is *C. mergeleña*, Hew.

Our figure represents the type, which came from Lion Hill.

4. *Ceratinia dionæa*.

Ithomia dionæa, Hew. Ex. Butt., *Ith.* tab. v. f. 24¹.

Alis anticis fulvis, parte apicali, costæ basi, margine interno et maculis duabus triangularibus (una intra cellulam, altera inter ramos medianos primum et secundum, hac apici nigro conjuncta) nigris; fasciis subapicalibus, una infra eas, et septem in margine externo seriatim positæ sulphureo-flavis; posticis fulvis, stria transversa et margine externo nigris: subtus sicut supra sed alis pallidioribus et margine posticarum nigro punctis septem albis ornato.

Hab. GUATEMALA, forests of Northern Vera Paz and Polochic valley (*F. D. G. & O. S.*).—VENEZUELA¹.

This species was described by Hewitson from specimens said to have come from Venezuela; but we have not yet met with it in collections from that country, whereas examples of *C. fenestella* occur in them not unfrequently. The only specimens we have seen are those obtained by ourselves in Guatemala, where, however, it cannot be said to be a common species. These agree very well with Hewitson's figure. They show, however, some variation amongst themselves, in that the isolated spot between the first and second median branches of the primaries is in some specimens yellow (as in the typical figure), in others tawny. In *C. fenestella* this spot becomes part of the transverse yellow subapical band, and thus shows a somewhat different disposition of the yellow marks of this portion of the wing. The two races, however, are very closely allied.

5. *Ceratinia fenestella*.

Ithomia fenestella, Hew. Ex. Butt., *Ith.* tab. v. f. 25¹.

Ceratinia fenestella, Butl. & Druce, P. Z. S. 1874, p. 334².

C. dionææ simillima, sed alarum anticarum macula sulphurea inter ramos secundum et tertium margini externo propior et fasciola transversa subapicali plerumque confluentibus, macula nigra inter ramos medianos primum et secundum subrotunda et apice nigro disjuncta.

Hab. NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*², *Carmiol*).—VENEZUELA¹; TRINIDAD.

We can detect no difference between Nicaraguan and Venezuelan specimens of this race, though a considerable gap in its range occurs in the State of Panama, where its place is taken by its near ally *C. leucania*. Judging from the number of specimens that have reached us, it would appear to be as common an insect in Nicaragua and Costa Rica as in Venezuela. The differences which separate it from *C. dionæa* are mentioned in the account of the latter species.

6. **Ceratinia leucania.** (*Ithomia leucania*, Tab. III. fig. 9.)

Ithomia (*Ceratinia*) *leucania*, Bates, P. Z. S. 1863, p. 246, pl. 29. f. 2.

C. dionææ similis, sed alarum anticarum dimidio apicali maculis albis (interdum flavis) notato; fasciola per cellulam transeunte quoque alba (interdum flava) sæpe obsoleta, sæpe maculis duabus bipartita; maculis nigris cellulae et iis inter ramos medianos primum et secundum plerumque apice nigro confluentibus.

Hab. PANAMA, Lion Hill (*McLeannan*), Veraguas (*Arcé*).

This is a close ally of *C. fenestella* and *C. dionæa*, being nearer the former. The chief apparent difference consists, in the majority of specimens, of the spots of the distal half of the primaries being white instead of yellow. Some examples, however, have these spots yellow just as in *C. fenestella*; others have only a yellow tinge; so that a complete gradation can be shown, in which these spots pass from one colour to the other. The character therefore fails to be a diagnostic one. In *C. leucania* the black colour of the apical portion of the primaries is more extensive than in *C. fenestella*, the discal spot and the one under it being usually united to the black portion of the wing. This greater extension of the black in *C. leucania* renders it not difficult to discriminate the race from *C. fenestella*, even when yellow spots are present instead of white ones. The race, though abundant in the State of Panama, does not pass out of it.

Our figure represents a male from Lion Hill.

7. **Ceratinia callispila.** (*Ithomia callispila*, Tab. III. figg. 6, 7.)

Ithomia (*Ceratinia*) *callispila*, Bates, Ent. M. Mag. iii. p. 85¹.

Ceratinia callispila, Butl. & Druce, P. Z. S. 1874, p. 334².

Alis anticis fusco-nigris, macula fulva subtriangulari ad basin plus minusve angulum analem versus extendente et interdum marginem internum includente; macula elongata obliqua ad cellulae finem, fasciola submarginali, venis divisa, duabus infra eam et septem in margine seriatim positae flavae; posticis fulvis, angulum apicalem versus anguste nigro marginatis, et macula nigra extra cellulam (interdum in fasciam transversam producta): subtus sicut supra, sed posticarum margine indistincte albo punctulato.

Hab. NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Carmiol*¹, *Van Patten*²), Cache (*Rogers*); PANAMA, Veraguas (*Arcé*).

BIOL. CENT.-AMER., Rhopal., Vol. 1, Sept. 1879.

E

This is a somewhat isolated species, having no very near allies, though *C. cleis* appears to be its next of kin. Great variation, irrespective of sex, is noticeable in the black median band of the secondaries. In the majority of specimens an isolated black spot beyond the end of the cell is all that is shown. In some a well-defined black band is present; and between these extremes every gradation can be traced.

The species seems to be abundant in Nicaragua and Costa Rica, but does not pass much beyond these limits, as we have as yet only seen a single specimen from the State of Panama and none from more northern districts.

Our figures are taken from two male specimens, one (fig. 6) from Costa Rica (agreeing exactly with the types), the other (fig. 7) from Nicaragua.

NAPEOGENES.

Napeogenes, Bates, Trans. Linn. Soc. xxiii. p. 533 (1861).

Tarsus of female with four joints, a pair of spurs on each of the second and third joints; primaries with recurrent nervule on upper discocellular; no recurrent nervule on secondaries; median nervure and discocellulars of secondaries nearly in a line; cell very long.

Mr. Bates, when describing this genus in 1861, enumerated seventeen species as belonging to it. Subsequent researches have since more than doubled this number. Though well represented in the valley of the Amazons, the genus has many species inhabiting the slopes of the Andes from Bolivia to Colombia; but none of them have a wide range. Central America has but three—one (*N. tolosa*) extending from Mexico to Panama, one peculiar to Costa Rica, and one restricted to Panama.

The genus is an extremely interesting one, from the fact that almost all its members mimic some commoner species of *Ithomia* found in the same district. Dr. Boisduval (Lep. Guat. p. 32) includes two other species of this genus as found in Central America under the names *Ceratomia stella* (Hew.), from Nicaragua, and *Choridis peridia* (Hew.), from Costa Rica; but both are Colombian species, from which country doubtless his specimens came.

1. *Napeogenes hemimelæna*. (Tab. III. fig. 3.)

Napeogenes hemimelæna, Godm. & Salv. P. Z. S. 1877, p. 60¹.

♀ alis anticis nigris, flavo maculatis, maculis duabus discalibus, una majore extra cellulam venis divisa, duabus inter ramos medianos, serio quoque punctorum submarginalium a costa ad angulum analem extendente; posticis dimidio basali lateritio-fulvo, margine exteriori irregulari, dimidio apicali nigro, angulo anali punctis duabus minutis et serie submarginali flavis notato.

Hab. PANAMA (*Ribbe*), Lion Hill (*M^cLeannan*¹, *Mus. Vindob.*).

Of this species we have only seen four examples—one (a male) in the collection of Dr. Staudinger, another (a female) in our own, and two in the Vienna Museum. Our specimen is figured on Plate III. fig. 3. All these were taken on the line of the Panama Railway. The nearest ally of *N. hemimelæna* is *N. peridia* (Hew.), of Colombia, from which it differs in having the two inner series of yellow spots in the apex of the primaries blended into one large one, and in the almost total absence of the large yellow spots in the apical angle of the secondaries.

2. *Napeogenes tolosa*. (Tab. II. fig. 1, & Tab. III. fig. 4.)

Ithomia tolosa, Hew. Ex. Butt., *Ith.* t. xii. f. 72¹.

Napeogenes tolosa, Butl. & Druce, P. Z. S. 1874, p. 334².

Alis fulvis, anticarum costa et dimidio apicali nigris, hoc maculis quinque flavis notato, una discali subquadrata, reliquis in area apicali positis; margine externo serie punctorum alborum notato; posticis nigro marginatis: subtus ut supra, sed alis pallidioribus, marginibus externis punctis albis notatis.

Hab. MEXICO¹; GUATEMALA, Polochic valley (*H. Hague*); SAN SALVADOR (*Mus. Staudinger*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*²), Irazu (*Rogers*); PANAMA, Chiriqui and Veraguas (*Arcé*).

The typical specimen of this species came from Mexico; but we have never yet met with it in collections from that country. In Guatemala it must be very rare, as a single specimen only has reached us; and this was taken in the valley of the Rio Polochic by one of Mr. Hague's collectors. For the sight of a male specimen from San Salvador we are indebted to the kindness of Dr. Staudinger. This we have represented on Plate II. fig. 1. The presence of yellow spots at the apical angle of the secondaries in this example makes us doubt the accuracy of the determination of the sex of Hewitson's specimen, which we believe to be a female, and not a male as there stated¹. Nicaraguan examples, and all from more southern localities, depart somewhat from the northern type. The primaries of these have the fulvous of the basal portion more restricted, in some specimens the base of these wings being wholly black. The spots, too, of the apex are usually of smaller size. As very considerable variation exists between individuals from these southern localities, and as some almost exactly resemble our Guatemalan example, we cannot separate them as a distinct race, though differentiation has proceeded to a considerable extent. Our figure on Plate III. fig. 4, represents a male of the Nicaraguan form. Though doubtless rare in the northern parts of Central America, it must be common in Nicaragua, judging from the number of specimens sent from that country from time to time. The pattern of *Mechanitis isthmia* is that which this species affects in the countries where both species are found.

3. *Napeogenes pædaretus*. (Tab. IV. figg. 4, 5.)

Napeogenys pædaretus, Godm. & Salv. Ann. & Mag. N. H. ser. 5, ii. p. 257.

- ♂ alis flavo-hyalinis nigro circumdatis, anticarum area venæ medianæ fulvo lavata, macula triangulari nigra ad cellulæ finem, area apicali venis nigris divisa; posticarum margine nigro, intus fulvo tineto, apicibus albo punctatis: subtus sicut supra, sed marginibus externis albo punctulatis.
- ♀ mari similis, sed anticis fusciscentioribus, area apicali maculis elongatis semihyalinis inter venas notata et una subquadrata concolori intra cellulam; posticis ferrugineis margine nigro ad angulum analem fere obsoleto, maculis duabus semihyalinis ad angulum analem vix apparentibus.

Hab. COSTA RICA, Irazu and Rio Sucio (*Rogers*).

Of this beautiful species a pair alone have reached us. These were collected in the above localities by Mr. H. Rogers. The male bears a close resemblance to the same sex of *Ithomia xenos*, while the female has the pattern of that sex of *Dircenna relata*. The peculiar neuration of the secondaries at once distinguishes them from either of those species.

Both specimens are represented in our plate.

DIRCENNA.

Dircenna, Doubleday, Gen. Diurn. Lep. i. p. 119 (1847).

Tarsus of front leg of female with four joints, a pair of spurs on each of the second and third joints (sometimes also on the first); primaries with recurrent nervule on the lower discocellular; a strong recurrent nervule on lower discocellular of secondaries; middle discocellular of secondaries of male gradually curved and directed outwards, upper discocellular absent; upper radial anastomosing with subcostal at the end of the cell; costal and subcostal strongly arched; cell of secondaries short, and lower segment of discocellular directed inwards.

The genus *Dircenna* was established by Doubleday to receive *D. klugi* and another South-American species. Since then, numerous *Ithomiæ* have been placed in it; and the definition of the genus has become obscured by these additions. The hairiness of the palpi, upon which Doubleday placed much stress, does not seem to be a character to be relied upon as distinctive of the genus. The joints of the tarsus of the female, four in number, coupled with the shortness of the cell of the secondaries, seem to be associated in no other group of *Ithomia*; and we therefore restrict the term *Dircenna* to the insects having these characters. The genus as thus restricted has a wide range, extending from Brazil to Mexico. Five species are found within our limits, of which one reaches Mexico and two Guatemala; the rest are found in the more southern parts of the Isthmus.

1. *Dircenna klugi*.

Ceratinia klugii, Geyer, Hübn. Zutr. ex. Sehm. f. 801, 802¹.

Dircenna klugi, Doubl. & Hew. Gen. Diurn. Lep. p. 121²; Butl. & Druce, P. Z. S. 1874, p. 331³.

- ♂ alis fusco-hyalinis; anticarum costa, marginis externi ciliis, fasciaque in margine interno (utrinque rufo tincta) fusco-nigris; fascia arcuata a basi ad angulum analem extensa, macula subquadrata apud cellulæ finem et octo extra eam (aream apicalem occupantibus) flavido-hyalinis; posticis fulvescentibus nigro marginatis: subtus ut supra, posticarum costa macula elongata alba notata et limbo externo maculis septem albis ornato; antennis flavis, basi nigris.
- ♂ mari similis, sed coloribus lætioribus et maculis anticarum flavidis magis distinctis, maculisque albis paginæ inferioris majoribus.

Hab. MEXICO ¹ (*Sallé*), Atayac (*Hedemann, Mus. Vindob.*), Oaxaca (*Deppe, Mus. Berol., Fenochio*); GUATEMALA, Retalhuleu, Dueñas, Chuacus, San Gerónimo (*F. D. G. & O. S.*), Chisoy valley and Polochic valley (*Hague*); COSTA RICA (*Van Patten* ³), San Francisco, Irazu (*Rogers*).

Originally described from Mexican specimens ¹, *D. klugi* has since been found in numbers in the southern parts of that country; and it would appear to be equally common in Guatemala, where it is perhaps the most abundant of all *Ithomiinæ* up to an elevation of about 5000 feet. In the mountainous parts it is more frequently met with than in the low-lying tropical forests; and this may account for its not being found in Nicaragua, whereas in the mountains of Costa Rica it again appears. It is nearly allied to *D. relata*; and some signs of connecting links between the two are not wanting in Costa Rica, where both are found.

2. *Dircenna relata*.

Dircenna relata, Butl. & Druce, Cist. Ent. i. p. 95 ¹; Butl. Lep. Ex. p. 139, t. 50. f. 3 ².

Dircenna olyras, Butl. & Druce, P. Z. S. 1874, p. 331 (nec Felder).

- ♂ *D. klugi* similis, sed alis obscurioribus, anticarum basi fere nigra, posticarum margine externo angulum apicalem versus latiore, area interna proxima foro pellucida, distali fulvescente, antennis flavis basi nigris.
- ♀ maculis anticarum magis distinctis et area posticarum interna unicolori rufa.

Hab. NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten* ^{1 2}), Caché (*Rogers*); PANAMA, Chiriqui and Calobre (*Aréé*).

This is a close ally of *D. klugi*, the place of which it seems to take, to some extent, in the southern parts of Central America, where it would appear to be as common as *D. klugi* is in Mexico and Guatemala. The chief distinctions between the two consist in the darker colour of the wings, and the smaller size and the greater distinctness of the pale yellowish spots of the primaries. It is a somewhat smaller insect, and has, in the male, more fulvous colour on the outer half of the inner area of the secondaries. Our descriptions are based upon Costa-Rica examples, the male being the type of the species, the female a Caché specimen.

3. *Dircenna olyras*.

Ithomia olyras, Feld. Reis. d. Nov., Lep. p. 358, t. 44. f. 5, 6.

- ♀ *D. klugi* affinis, sed alis obscurioribus, anticarum basi omnino nigra; posticis fascia lata albescente alam mediam occupante ornatis. Ab *D. relata* posticarum coloribus differt.

Hab. NICARAGUA, Chontales (*Belt*).

We have only a single female example of this species, agreeing with Dr. Felder's Plate. The specimens so called in Messrs. Butler and Druce's paper are best referred to *D. relata*.

4. *Dircenna lonera*.

Dircenna lonera, Butl. & Druce, Cist. Ent. i. p. 95¹; Butl. Lep. Ex. p. 139, t. 50. f. 2².

♀ *D. relatae* similis, sed alis latioribus, et maculis antecarum hyalinis (nec flavis) confluentibus; fascia lata sicut in *D. olyras* posticis notatis: subtus margine posticarum externo tantum albo maculato, costae maculis albis nullis.

Hab. COSTA RICA (*Van Patten*^{1 2}), Rio Sucio (*Rogers*).

Besides the single type specimen of this species we have only seen one other example. Unfortunately both are females. Several characters seem to distinguish *D. lonera* from its ally *D. olyras*, the chief one consisting of the greater transparency of the terminal half of the primaries, owing to the greater size of the hyaline spots. Beneath there are no costal white spots on the secondaries.

5. *Dircenna euchytna*. (*Ithomia euchytna*, Tab. III. figg. 16, 17.)

Ithomia euchytna, Feld. Reis. d. Nov., Lep. p. 357¹.

Dircenna euchytna, Butl. & Druce, P. Z. S. 1874, p. 332².

♂ alis flavo-hyalinis, anticis venis nigris divisis et fusco-nigro (nisi marginis interni parte basali rufa) circumcinctis; macula transversa per cellulæ medium et altera ad finem ejus fumatis, fascia subapicali indistincte fumata a costa ad marginem externum transeunte; posticis venis rufis divisis: subtus ut supra, anticis tribus (posticis una) maculis apicalibus albis notatis, una quoque posticarum costali et octo submarginalibus maculis albis ornatis.

♀ mari similis, sed coloribus multo saturatoribus et maculis obscuris multo latioribus, area quoque posticarum interna unicolori fulva differt.

Hab. GUATEMALA, Choctum and Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*, *Janson*); COSTA RICA (*Van Patten*²); PANAMA, Chiriqui (*Arcé*, *Ribbe*), Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—COLOMBIA¹.

This is a common species in the northern parts of South America and Central America as far as Nicaragua. In Guatemala it is not so abundant, its range being apparently restricted to certain parts of the department of Vera Paz. The variation observable in specimens from different parts in this wide area is not great, and consists chiefly in the colour of the basal part of the inner margin of the secondaries. In some specimens this is fulvous, in others almost black; and intermediates occur between these extremes.

Our figures and descriptions are taken from specimens caught in the valley of the Rio Polochic, Guatemala.

CALLITHOMIA.

Callithomia, Bates, Trans. Linn. Soc. xxiii. p. 522 (1861).

Costa of secondaries of male highly arched; lower discocellular straight, meeting the median nervure at a small obtuse angle; middle discocellular bent to a right angle, lower segment short, a long strong recurrent nervule emitted from the angle; upper discocellular short, meeting the subcostal near its extremity at about two thirds of the length of the costa from its base; costal and subcostal nervures near together, slightly divergent towards their distal ends; first segment of subcostal much longer than the three segments of the median; second segment very short; the upper radial of secondaries of female joins the subcostal beyond the cell.

This genus contains about ten species, so far as is at present known, which are distributed over the valley of the Amazons, Peru, Venezuela, Colombia, and Central America as far north as Guatemala. In the latter country three species have been discovered. The best-known of these (*C. hezia*) ranges from Nicaragua to the northern parts of the State of Panama; *C. hedila* is peculiar to the forests of Guatemala, whilst *C. panamensis* is only known from a single specimen taken on the line of the Panama Railway.

1. *Callithomia hezia*.

Ithomia hezia, Hew. Ex. Butt., *Ith.* t. 4. f. 21¹.

Callithomia hezia, Butl. & Druce, P. Z. S. 1874, p. 331².

Alis anticis nigris, dimidio apicali maculis flavis notato, duabus intra cellulam, serie subapicali a costa ad angulum analem extendente, altera interiore, et tribus aut quatuor ad apicem; posticis fulvis, apice late nigro: subtus ut supra, maculis apicalibus anticarum et margine posticarum albis.

Hab. NICARAGUA (*Mus. Brit.*¹), Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*²), Irazu (*Rogers*); PANAMA, Chiriqui (*Zahn*), Calobre (*Arcé*).

Hewitson's plate was drawn from a Nicaraguan specimen in the British Museum. From the same country we have received numerous examples taken in the district of Chontales by Belt and Mr. E. M. Janson. All these, as well as more southern specimens from Costa Rica and Panama, agree in having the spots on the primaries small and distinct, whereas in the Guatemalan form these are much larger and more confluent. In the southern continent *C. hezia* is represented by two allied forms:—one, *C. tridactyla*, Dewitz (*Mitth. münch. ent. Ver.* i. p. 86, t. 2. f. 2), found in the Colombian State of Antioquia; the other, *C. phagesia*, Hew. (*Ex. Butt., Ith.* t. 29. f. 186), from Ecuador and Peru, of which we possess a female example taken by Mr. H. Whitely at Chanchamayo in the latter country. Both these southern species are at once distinguishable from *C. hezia* by a hyaline patch near the anal angle of the secondaries.

2. *Callithomia hedila*, n. sp. (*C. hezia*, Tab. III. fig. 1.)

C. hezia simillima, sed maculis alarum anticarum majoribus et confluentibus, parte nigra posticarum latioro, dimidium alarum occupante: subtus ut supra, maculis apicalibus anticarum et quatuor punctis submarginalibus posticarum albis.

Hab. GUATEMALA, forests of Northern Vera Paz, Choctum (*F. D. G. & O. S.*), Polochic valley (*H. Hague*).

The Guatemalan race of *C. hezia* seems fairly separable as a species. A considerable series shows that the spots of the primaries are larger and more confluent, and that the apical portion of the same wings is in consequence more transparent. The secondaries, too, have more black on the apical half, the fulvous portion being restricted to the region of the abdominal margin.

We took several specimens of this butterfly in the forests of the northern portion of Vera Paz, both near the Indian village of Choctum and on the road to Peten. They were found at an elevation of from 1000 to 2000 feet above the sea, and were usually observed flitting along the forest-paths. Other specimens have since been sent us by Mr. Hague from the valley of the Rio Polochic. We have no evidence of the existence of the species in the forests of the Pacific side of Guatemala. Our figure is taken from a female captured in the valley of the Rio Polochic.

3. *Callithomia panamensis*. (Tab. II. fig. 2.)

Callithomia panamensis, Godm. & Salv. Ann. & Mag. N. H. ser. 5, ii. p. 257.

Alis, fuscis, dimidio apicali et punctis duobus (uno intra, altero extra cellulam) nigris, macula lata extus irregulariter marginata ad terminum cellulæ posita, et fascia subapicali, venis divisa, flavis; posticis late nigro marginatis.

Hab. PANAMA (*Ribbe*).

This species is a near ally of *C. beronilla*, Hew. (*Ex. Butt., Ith.* t. 33. f. 222), of Colombia, but differs from it in the much greater breadth of the transverse yellow median band of the primaries. We have only as yet seen a single specimen of the species, which was captured by Herr Ribbe, and is now in Dr. Staudinger's collection. From this our figure and description were taken.

EPITHOMIA (gen. nov.).

Costa of secondaries of male highly arched; lower discocellular bent to a right angle close to its upper end, where it emits a long recurrent nervule; middle discocellular simply curved; upper discocellular short, meeting the subcostal at an obtuse angle close to its extremity at a point less than two thirds of the costal margin from its base; costal and subcostal nervures slightly divergent, the latter but slightly curved;

first segment of subcostal longer than the three median segments; second segment very short. Tarsus of front leg of female with five joints, a pair of spurs on each of the second and third joints. (Type *Dircenna callipero*, Bates.)

The single species which we propose to place in this separate genus has many characters in common with *Callithomia*. The palpi are hairy and have a comparatively long terminal joint; the secondaries are arched as in *Callithomia*. The neururation of the secondaries differs, however, in important points, the recurrent nervule being emitted from the lower discocellular instead of the middle. From *Dircenna* it differs not only in having a five- instead of a four-jointed tarsus to the front leg of the female, but in other characters, in the neururation of the secondaries.

1. **Epithomia callipero.** (*Ithomia callipero*, Tab. III. fig. 14.)

Dircenna callipero, Bates, P. Z. S. 1863, p. 243, t. xxix. f. 4¹; Ent. M. Mag. iii. p. 156².

Ithomia balboa, Bates, P. Z. S. 1863, p. 245³.

Ithomia agrippina, Hew. Ex. Butt. *Ith.* t. 24. f. 152⁴?

♂ alis semihyalinis, antecarum tertia parte basali fulva, dimidio apicali fumoso-nigro, fascia obliqua per cellulam angulum analem versus transeunte flava, altera subapicali magis pellucida venis divisa, plaga nigra in cellulae medio; posticis fulvis nigro late marginatis: subtus sicut supra, sed marginibus antecarum tribus, posticarum septem punctulis albis notatis; antennis nigris, apicibus flavis. ♀ mari similis, sed alis paulo opacioribus.

Hab. PANAMA, Lion Hill (*M'Leannan*^{1 2}).—COLOMBIA⁴?

This species does not agree structurally with *Dircenna*, where Mr. Bates originally placed it, a view, however, which he subsequently altered³. Whether *Ithomia agrippina*⁴ is distinct or not from *E. callipero* it is not easy now to decide. Besides the apparent difference of neururation to which Mr. Bates has called attention³, Hewitson's figure shows a yellow spot between the second and third median branches of the primaries, not seen in *E. callipero*. Hewitson's type, formerly in Birchall's collection, has now probably been lost sight of; and therefore the accuracy of the plate representing it, as regards the neururation, cannot be tested. Under this uncertainty respecting *I. agrippina*, and seeing that the description of *E. callipero* was read some days before the part of 'Exotic Butterflies' containing the figure of *I. agrippina* was issued, we feel justified in using Mr. Bates's name.

E. callipero appears to have a very restricted range, and, though common on the line of the Panama railway, it does not occur beyond it, as none of the Veraguan collections which we have examined has contained examples.

Our figure and descriptions are taken from M'Leannan's specimens.

CALLOLERIA (gen. nov.).

Costa of secondaries of male gradually arched; lower discocellular, meeting the median at an acute angle, is bent to a right angle (where it emits the recurrent

nervule) near its upper end; middle discocellular gradually curved; upper discocellular very short, meeting the subcostal at about three fourths of its length from its base; cell moderately short, but proximal segment of subcostal longer than the three median segments; costal and subcostal nervures gradually divergent, but the former approaches the latter near its distal end. Secondaries of female with a short upper discocellular. Tarsus of front leg of female with five joints, with a pair of spurs on each of the second and third joints. (Type *Ithomia tutia*, Hew.)

This section of *Ithomia* comprehends about eight or nine Tropical-American species, all more or less nearly allied. Two of these penetrate into Central America. As a group *Calloleria* seems allied to *Epithomia*; but the costa of the secondaries is less highly arched, the palpi seem less hairy, and the distal segment of the subcostal nervure much longer in proportion to the length of the nervure itself.

1. *Calloleria tutia*.

Ithomia tutia, Hew. Ex. Butt. *Ith.* t. ii. f. 6¹; Bates, Trans. Linn. Soc. xxiii. p. 539².

Pteronymia tutia, Butl. & Druce, P. Z. S. 1874, p. 332³.

Pteronymia azara, Butl. & Druce, P. Z. S. 1874, p. 332⁴.

Alis subhyalino-fulvis, anticarum area apicali (intus fere pellucida) maculis tribus discalibus et una apud ramum medianum secundum obscure fuscis, apice ipsa et fascia obliqua a costa angulum analem versus transeunte flavis; posticarum margine externo et linea longitudinale mediana fuscis: subtus ut supra, sed marginibus externis anticarum quatuor, posticarum septem punctulis albis notatis.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*³), Caché (*Rogers*).—COLOMBIA; VENEZUELA².

The Amazonian locality assigned to *C. tutia* by Hewitson¹ is no doubt erroneous, as Mr. Bates has already pointed out², indicating its correct habitat as Venezuela. We possess a specimen from the Sierra Nevada of Santa Marta precisely like Hewitson's figure, thus confirming Mr. Bates's statement.

The range of *C. tutia* seems to be completely broken in the State of Panama, where *C. azara* takes its place. In Costa Rica, however, the two forms blend to some extent; but the true *C. tutia* reappears in Nicaragua, uninfluenced by contact with *C. azara*. The intermediate forms are characterized by the varied extent of the pale subapical patch of the primaries, it being well developed in *C. tutia* and altogether absent in *C. azara*. It would seem as if *C. azara* were the aggressive form, and that it was gradually displacing *C. tutia* in the Central-American localities where the latter is found. We have not seen any Costa-Rican specimens wholly of the pattern of *C. azara*. The insects referred to that race by Messrs. Butler and Druce⁴ have all some of the characters of *C. tutia*; and, though doubtless intermediate between the two, we place them under the latter name.

2. *Calloleria azara*.

Ithomia azara, Hew. Ex. Butt. *Ith.* t. iv. f. 23¹; *Equat. Lep.* p. 13².

Ithomia dorilla, Bates, *Ent. M. Mag.* i. p. 35³, iii. p. 157⁴.

C. tutia similis, sed alarum coloribus saturationibus, macula pellucida apicis anticarum absente; posticarum linea longitudinali mediana fere obsoleta.

Hab. PANAMA, Calobre (*Arcé*), Lion Hill (*M^cLeannan*³).—ECUADOR^{1 2}.

Panama specimens of this species were described by Mr. Bates as distinct from the Ecuadorian *C. azara*³; but an examination of a larger series of examples subsequently showed him that the two were not really separable⁴. The insect is common on the Isthmus of Panama, where, as we have already said, it appears to supplant *C. tutia*—the two forms mingling in Costa Rica, where the true *C. azara* does not occur, so far as we know. In the southern continent this species is less common; but Mr. Buckley obtained specimens of it during his first journey to Ecuador².

HYPOSCADA (gen. nov.).

Antennæ long; costa of secondaries of male curved rather abruptly near the apex; lower discocellular bent to an acute angle where recurrent nervule is emitted; lower segment curved; upper segment straight, about half the length of the middle discocellular; upper discocellular directed outwards about half the length of the middle discocellular; proximal segment of the subcostal not much longer than the distal segment, and about equal to the three segments of the median nervure; cell consequently short; costal and subcostal nervures wide apart and but slightly curved at their distal ends. Tarsus of front leg of female with five joints, with a pair of spurs on each of the second and third joints. (Type *Ithomia adelphina*, Bates.)

The shortness of the cell of the secondaries in the male of this butterfly, coupled with the wide separation of the costal and subcostal nervures and the length of the antennæ, seems to justify its removal from the old genus *Ithomia*.

Only two closely allied species are found in Central America; but in South America several more occur. These show considerable diversity of coloration, but in the main the same wing-structure.

1. *Hyposcada virginiana*.

Ithomia virginia, Hew. Ex. Butt. *Ith.* t. ix. f. 54¹ (nec t. iii. f. 18).

Ithomia virginiana, Hew. Ex. Butt. *Ith.* t. xviii. f. 111, text²; Bates, *Ent. M. Mag.* iii. p. 52³.

H. adelphinae similis, sed supra obscuriore; area anticarum ferruginea ramum medianum secundum tenus (nisi margine interno) extendente, maculis albis vix flavescenti tinctis: alis subtus quoque dilutioribus colore paginae superioris nigro ferrugineo multo intermixto.

Hab. MEXICO¹ (*Hedemann*, *Mus. Vindob.*); GUATEMALA², forests of N. Vera Paz (*F. D. G. & O. S.*), Polochic valley (*H. Hague*), Zapote (*Champion*).

This species was originally described by Hewitson from a Mexican specimen as *Ithomia virginia*¹, a name he had previously used for an Amazon species of *Ithomia*. This oversight he afterwards corrected, and substituted the name *I. virginiana* when figuring a Colombian insect which he took to be a female of the Mexican form². The differences between the two were subsequently pointed out by Mr. Bates³, and are embodied in our diagnoses now given.

H. virginiana is by no means a common species; the only Mexican specimens we have seen are those in the Vienna Museum. In Guatemala we only met with it ourselves when visiting the lowland forests of Vera Paz north of the town of Coban. Here, however, it was rare; the few specimens we found were flitting near the forest-paths just like other members of this numerous family. It also occurs in Western Guatemala, Mr. Champion having recently sent us specimens from Zapote, on the slope of the Volcan de Fuego, 2100 feet above the sea. A near ally of *H. virginiana* is found in some of the Andean valleys of Ecuador; and it seems reasonable to suppose that these are the least changed from the protean form, and that a centre of variation has become established in and about the Isthmus of Panama, which has resulted in *H. adelphina*, in which unstable characters are still plainly traceable.

2. *Hyposcada adelphina*. (*Ithomia adelphina*, Tab. III. fig. 13.)

Ithomia virginiana ♀, Hew. Ex. Butt. *Ith.* t. xviii. f. 112¹.

Ithomia adelphina, Bates, Ent. M. Mag. iii. p. 52².

Ithomia adelphina, var., Butl. & Druce, P. Z. S. 1874, p. 332³.

Alis anticis nigris, area anticarum basali (stirpe typica) ferruginea (sed interdum fere omnino nigra); dimidio apicali maculis decem albis ornato, duabus ad cellulæ finem, una ultra eam costam attingente, una angulum analem versus, quinque submarginalibus limbum apicalem sequentibus et una interiore positis; posticis ferrugineis limbo apicali nigro, punctis albis trinotato: subtus sicut supra posticis linea subcostali nigra.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*³), Caché, Rio Sucio (*Rogers*); PANAMA, Chiriqui (*Ribbe*, *Mus. Staudinger*), Calobre (*Arcé*), Lion Hill (*M^r Leannan*²).

Mr. Bates's description of this butterfly was based upon specimens sent us from Panama². Subsequent comparison with Colombian examples has shown us that no specific differences can be traced between them, and that therefore the insect described and figured by Hewitson as the female of *I. virginiana*¹ must be referred to *H. adelphina*, a point concerning which Mr. Bates was in some doubt. In Costa Rica and Nicaragua considerable variation exists in this race, chiefly as regards the extent of the ferruginous patch at the base of the primaries. In some specimens this patch is hardly shown at all; in others it is much more apparent. It is, however, essentially uncertain in amount in different examples, and thus cannot be used as a character by which to discriminate these varieties from the typical form. *H. adelphina* appears to be much more numerous than *H. virginiana* in their respective homes.

LEUCOTHYRIS.

Leucothyris, Boisduval, Lép. Guat. p. 32 (1870).

Antennæ moderately long; costa of secondaries of male gradually curved; lower discocellular bent to an acute angle where it emits the recurrent nervule; upper segment long, and in a line with the long middle discocellular; upper discocellular directed slightly forwards; distal segment of subcostal very short; proximal segment much longer than the three segments of the median nervure, and consequently the subcostal portion of the cell is very long; costal and subcostal nervures close together. Tarsus of front leg of female with five joints, with a pair of spurs on each of the second and third joints. (Type *Ithomia ilerdina*, Hew.)

These characters group a number of insects of considerable diversity of coloration, but of common wing-structure. The cell near the subcostal nervure is produced quite into the region of the apical angle in some species, as in *L. rubescens* and *L. victorina*, and especially in *L. vicina*. In *L. makrena*, though this part of the cell is not so long as in those just mentioned, it is still considerably longer than that part which lies next the median nervure.

Leucothyris is represented in Central America by seven species, of which *L. victorina* enjoys a wide range, extending from Mexico over the whole area of Central America, and passing into South America as far as Bolivia. *L. zea* is peculiar to Mexico and Guatemala, its representative in Costa Rica and Panama being *L. vicina*. Costa Rica and Panama have also two more peculiar species in *L. rubescens* and *L. pagasa*; in Panama alone has *L. æsion* at present been found; and here too the common Colombian species, *L. makrena*, has also been met with.

1. *Leucothyris victorina*.

Heliconia victorine, Guér. Icon. Règne Anim. Ins. iii. p. 470¹.

Ithomia victorina, Hew. Ex. Butt. *Ith.* t. xiii. f. 75².

Leucothyris victorina, Butl. & Druce, P. Z. S. 1874, p. 333³.

Alis hyalinis, venis nigris divisis, anticis macula subquadrata ad cellulæ finem et marginibus (præter costæ dimidium basale rufum) fusco-nigris, fascia subapicali a costa ad marginem externum transeunte alba; posticis limbo externo fusco-nigro linea rufa intus notato: subtus ut supra, sed maculis obscuris rufescentioribus, posticarum apicibus atomis albis bipunctatis; antennis omnino nigris. Sexus quoad colores fere similes.

Hab. MEXICO (*Bilimek*, *Mus. Vindob.*), Oaxaca (*Fenochio*), Putla (*Rébouch*); GUATEMALA, forests of N. Vera Paz, San Gerónimo, Rio Polochic, Rio Motagua, Retalhuleu (*F. D. G. & O. S.*), Zapote (*Champion*); HONDURAS, San Pedro (*G. M. Whitely*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*³), Caché (*Rogers*); PANAMA, Chiriqui, Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—VENEZUELA²; PERU; BOLIVIA¹.

We are fortunate in possessing a Bolivian specimen of this species, obtained some

years ago from Mons. E. Deyrolle, and purporting to be Guérin-Méneville's type specimen. This agrees with Peruvian and Venezuelan examples (the latter figured by Hewitson²) in having the border of the secondaries black and the base of the costa uniform with the rest, and not rufous. Northern specimens differ in this respect, and also in having a narrower white transverse band to the primaries. These differences are so slight that we hesitate to separate the Central-American insect by a distinct name.

L. victorina, in Central America, is one of the commonest species of butterfly, and is found in all forest districts up to an elevation of about 3000 feet, beyond which it does not seem to pass.

The type being a female, we have described an insect of that sex taken at Chuacus in Vera Paz.

2. *Leucothyris rubescens*.

Leucothyris rubescens, Butl. & Druce, Cist. Ent. i. p. 97¹; P. Z. S. 1874, p. 334; Butl. Lep. Ex. p. 141, t. l. f. 9.

Alis hyalinis, antecarum marginibus (apice paulo latiore), stria angusta transversa per cellulam mediam ducta, altera subquadrata apud finem et venis fusco-nigris, stria subapicali transversa cretaceo-alba; posticis rufescenti-nigro marginatis et venis nigris notatis: subtus sicut supra, sed maculis omnibus obscuris rufescentioribus, alarum apicibus maculis albis bipunctulatis.

Hab. COSTA RICA (*Van Patten*¹), Cache (*Rogers*); PANAMA, Chiriqui (*Ribbe*, *Mus. Staudinger*), Calobre (*Arcé*).

A near ally of *Ithomia phemonoe*, Doubl. (Hew. Ex. B. *Ith.* t. 17. f. 102, 103, 104), of Venezuela, but differing in the greater size of the black quadrate spot at the end of the cell of the primaries and in the greater breadth of the dark margins to both wings, especially about the apical angle of the primaries; the margin of the secondaries, too, is tinged with rufous instead of being quite black.

L. rubescens has a restricted range in Central America, not passing northwards of Costa Rica nor southwards of Calobre, in the State of Panama. It is probably confined to forests of some elevation above the sea-level.

3. *Leucothyris zea*.

Ithomia zea, Hew. Ex. Butt. *Ith.* t. vii. f. 40¹.

Alis hyalinis, venis nigris divis; antecarum marginibus macula transversa intra cellulam, altera subquadrata apud finem ejus et limbo externo (intus valde sinuato) rufis, maculis duabus subapicalibus vitreis, fascia obliqua a costa ad marginem externum transeunte albescente; posticis, præter marginem analem, rufo marginatis: subtus sicut supra sed maculis pallidius rufis; anticis puncto apicali et posticis maculis submarginalibus albis notatis.

Hab. MEXICO¹, Jalapa (*Deppe*, *Mus. Berol.*); GUATEMALA, San Gerónimo, Polochic valley (*Hague*), Volcan de Fuego (*Salvin*).

This species was first described by Hewitson from a specimen in Dr. Boisduval's collection, said to have been sent from Mexico¹, from which country we have seen an example in the Berlin Museum. It is not uncommon in restricted localities in Guatemala, especially in the portion of the estate of San Gerónimo in Vera Paz called San Lorenzo, which skirts the hills surrounding the eastern end of the plain of Salamá. It has also been sent us from the valley of the Polochic, but in smaller numbers. In 1873, at the end of December, Salvin found *L. zea* in the oak-forests of the eastern slope of the Volcan de Fuego, at an elevation of about 5500 feet above the sea. It was flitting in the open undergrowth of the forest, like other *Ithomiæ*, about four or five feet from the ground. Hewitson's figure¹ has the dark marks of the primary wings coloured blackish brown; in our Guatemalan specimens these marks are rufous, in which also the subapical white spot of the primaries is usually, but not always, confluent with the next transverse diaphanous band. In the figure referred to this spot is quite isolated.

4. *Leucothyris vicina*. (*Ithomia vicina*, Tab. III. fig. 18.)

Ithomia vicina, Salv. Ann. & Mag. N. H. ser. 4, iv. p. 169¹.

Leucothyris vicina, Butl. & Druce, P. Z. S. 1874, p. 333².

L. zea similis, sed marginibus maculisque rufis angustioribus, vitta anticarum discali corpori propriore, et macula ad cellulæ finem magis triangulari; maculis duabus vitreis ad apicem in aream hyalinam omnino confluentibus: subtus anticarum puncto albo in limbo costali, nec in margine externo posito, punctis albis posticarum *L. zea* submarginalibus absentibus.

Hab. COSTA RICA (*Carmirol*¹, *Van Patten*²), Irazu and Caché (*Rogers*); PANAMA, Volcan de Chiriqui (*Arcé*, *Zahn*).

A close ally of *L. zea*, whose place it appears to take in the mountainous parts of Costa Rica and in the volcano of Chiriqui. It is rather smaller than *L. zea*, and has all the dark markings of the primary wings smaller; the spot covering the end of the cell is triangular instead of subquadrate; and the mark across the cell is placed at a more acute angle and is nearer the body.

5. *Leucothyris æsion*. (*Ithomia æsion*, Tab. II. fig. 4.)

Ithomia æsion, Godm. & Salv. Ann. & Mag. N. H. ser. 5, ii. p. 258.

Alis fulvis, marginibus et dimidio anticarum apicali nigris, area apicali maculis quinque albis notatis, quatuor submarginalibus et una (maxima) extra cellulam ad costam fere attingente: subtus ut supra, sed alarum marginibus albo punctatis; antennis elongatis, nigris.

Hab. PANAMA, Candelaria (*Ribbe*, *Mus. Staudinger*).

A single male specimen (that described and figured) in Dr. Staudinger's collection, is the only one we have yet seen of this species. *L. æsion* belongs to the *L. illinissa*

group, and is most nearly allied to *L. abida* (Hew.), from which it differs in the absence of a black band on the secondaries.

6. **Leucothyris pagasa.** (*Ithomia pagasa*, Tab. III. fig. 15.)

Ithomia pagasa, Druce, Ent. M. Mag. xii. p. 126¹.

Alis obscure nigris, macula intra cellulam elongata ad basin extendente, altera subovata a costa per cellulam ad angulum analem ducta, altera extra eam minore et tribus submarginalibus flavo-hyalinis; posticis medialiter eodem colore notatis: subtus sicut supra, margine externo nigro punctis albis ornato.

Hab. COSTA RICA, Irazu (*Rogers*); PANAMA, Calobre (*Arcé*¹).

The nearest ally of this species is *L. zelica* (Hew.), from Western Ecuador; but it has many points of distinction. The yellow spots of the primaries are darker in tint and more distinct in outline; and the base of these wings is nearly black instead of the costa and inner margin alone being of that colour.

L. pagasa appears to be a rare species, but few specimens having come under our notice: of these, two were obtained by Mr. Rogers during his late expedition to Costa Rica; the rest, including Mr. Druce's type, all came from the neighbourhood of Veraguas, in the State of Panama.

7. **Leucothyris makrena.**

Ithomia makrena, Hew. Ex. Butt. *Ith.* t. v. f. 29¹.

Alis pellucidis, venis et marginibus, his intus valde sinuatis, fusco-nigris; cellula anticarum macula fusco-nigra trigona bisecta, macula altera ad finem subquadrata: subtus sicut supra, sed maculis omnibus obscuris rufescentioribus et limbo marginali maculis subobsoletis albis ornato.

Hab. PANAMA (*Ribbe*).—COLOMBIA¹.—ECUADOR; VENEZUELA.

This common Colombian species is only known to us as an inhabitant of Central America from a single specimen supplied to us by Herr Ribbe, who obtained it during his stay on the Panama railway-line. This specimen (a male) exactly resembles the typical form found in Colombia, from which Ecuadorian examples differ to some extent in the greater breadth of the marks of the primaries, and especially the margin of the secondaries.

EPISCADA (gen. nov.).

Costa of secondaries of male gradually curved; lower discocellular at right angles to third median segment and bent to a right angle where it emits the recurrent nervule; middle discocellular nearly in a line with upper segment of lower discocellular; upper discocellular short, directed outwards; upper radial twice as long as the distal segment of the subcostal; subcostal strong; proximal segment slightly

longer than the three segments of the median nervure ; costal and subcostal nervures divergent, but approximating towards their distal ends. Tarsus of front leg of female five-jointed, second and third joints strongly spurred. (Type *Ithomia salvinia*, Bates.)

In this section of the old genus *Ithomia* the secondaries of the male have the full complement of nervules ; but the cell is differently shaped from that of *Leucothyris*, being much shorter, and the upper discocellular so short that the upper radial lies close to the terminal segment of the subcostal. We are acquainted with fifteen or sixteen species belonging to this form, which range over a wide area from South Brazil to Mexico.

1. *Episcada salvinia*. (Tab. III. fig. 19.)

Ithomia salvinia, Bates, Ent. M. Mag. i. p. 34¹.

Alis hyalinis (venis divisis) omnibus anguste rubiginoso circumcinctis, anticis macula eodem colore ad cellulæ finem et vitta extra eam subquadrata alba ornatis : subtus ut supra, sed partibus rubiginosis paulo dilutioribus ; antennis omnino nigris.

♀ mari similis, sed alis brevioribus.

Hab. MEXICO, Jalapa (*Deppe*, *Mus. Berol.*), Oaxaca (*Fenochio*) ; BRITISH HONDURAS, Cockscomb Mountains (*Blancaneau*) ; GUATEMALA, Volcan de Fuego (*O. S.*), Zapote (*Champion*), San Gerónimo (*F. D. G. & O. S.*¹), Chisoy and Polochic Valleys (*Hague*).—COLOMBIA.

Mr. Bates's description of this species was based upon a female specimen taken by us near San Gerónimo in Vera Paz. Subsequently we received the male insect, which proved that the location assigned to the species by its describer was quite correct, and that it belongs to the group containing *Ithomia sylvo* and other allied forms.

E. salvinia is an upland species, seldom perhaps descending below an elevation of 2000 feet. The specimens taken in the Volcan de Fuego were found in one of the deep ravines clothed with dense forest lying on the north-east side of the mountain, at an elevation of about 6500 feet. Here they were quite common in July. One of our Mexican specimens was taken by Mr. Fenochio in the State of Oaxaca, on the east side of the Cordillera. Three specimens from Jalapa, taken by Deppe, and now in the Berlin Museum, perhaps mark the limit of the northern range of the species. The only evidence we have of the species being found southwards of Guatemala is a specimen, formerly in Mr. Bates's collection, marked as coming from "New Granada."

Our figure is taken from a female caught at San Gerónimo. This and a male from the Rio Chisoy are also described.

2. *Episcada apuleia*.

Ithomia apuleia, Hew. Ex. Butt., *Ith.* t. xxvi. f. 163¹.

Pteronymia salvinia, Butl. & Druce, P. Z. S. 1874, p. 332 (nec Bates)².

BIOL. CENT.-AMER., Rhopal., Vol. 1, Nov. 1879.

E. salvinia valde similis, sed alarum marginibus rufis angustioribus et macula alba anticarum omnino vel fero omnino absente distinguenda.

♀ mari similis, sed alarum marginibus paulo latioribus et macula alba anticarum magis distincta.

Hab. COSTA RICA (*Van Patten*²), Irazu (*Rogers*); PANAMA, Calobre (*Arcé*).—ECUADOR¹.

It is with some hesitation that we separate this southern race from the more northern *E. salvinia*; but it seems to differ constantly from that species in having the border of the wings very perceptibly narrower. An Ecuadorian specimen, doubtless referable to *E. apuleia*, comes very near indeed to our Costa-Rican examples; the only difference we can trace is in the total absence in the former of the white spot beyond the cell of the primaries, this spot in the latter being just visible. This slight difference is not sufficiently marked to render a separate name necessary. Messrs. Butler and Druce, in writing of this insect under the name *Pteronymia salvinia*², say that it seems to come very near *Ithomia gedera*, Hew. This is not so; for, *I. gedera* belonging to the *Hymenitis* section of *Ithomia*, the relationship is quite remote.

Our descriptions are taken from Costa-Rica specimens.

PTERONYMIA.

Pteronymia, Butl. & Druce, Cist. Ent. i. p. 96 (1872).

Costa of secondaries of male gradually curved; lower discocellular placed at a slightly obtuse angle to the third median segment, and bent to a wide acute angle where the recurrent nervule is emitted; upper segment very short, and nearly in a line with the slightly curved middle discocellular; upper discocellular absent; the upper radial also absent (section *b*), or (section *a*) appearing as a short branch to the subcostal; proximal segment of the subcostal a little longer than the three segments of the median nervure; costal and subcostal nervures nearly parallel; but the former approaches the latter near its distal end. Tarsus of front leg of female five-jointed; first, second, and third joints spurred. (Type *Ithomia aletta*, Hew.)

This group has the neurulation of the secondaries of the male of a very simple character, the upper discocellular being totally absent, and in the majority of the species the upper radial also. We are acquainted with more than forty species having the structure described above. These range from South Brazil to Mexico.

a. Secondaries of male with upper radial a short branch of the subcostal nervure.

1. *Pteronymia tigranes*, n. sp. (Tab. IV. figg. 10, 11.)

Pteronymia artena, Butl. & Druce, P. Z. S. 1874, p. 332 (nec Hew.)¹.

Alis hyalinis, venis nigris divisim marginibus fuseis notatis, anticis macula subquadrata eodem colore apud cellulae finem, altera eadem forma extra eam alba: subtus ut supra, sed coloribus paginae superioris obscuris rufescentioribus et alarum apicibus punctulis albis, anticarum tribus, posticarum una, ornatis; antennis omnino nigris.

♀ mari similis, sed alarum marginibus latioribus et rufescentioribus.

Hab. GUATEMALA, Polochic valley, Motagua valley, and San Gerónimo (*F. D. G. & O. S.*), Volcan de Fuego (*O. S.*), Zapote (*Champion*); COSTA RICA (*Van Patten*¹), Irazu (*Rogers*).

This species bears a close outward resemblance to *P. artena*, but differs from it in having the upper radial of the secondaries placed as a branch of the subcostal, instead of being entirely absent as in *P. artena*.

Like all species of *Ithomia* of similar coloration it affects mountainous districts, being probably not found at a lower elevation in Guatemala than 2000 feet. In the Volcan de Fuego it flies, in company with *Episcada salvinia* and *Leucothyris zea*, in the densely forested ravines on the north-eastern slope of the mountain, at an elevation of 6500 feet. In Costa Rica it is a common insect. Specimens from that country differ slightly from Guatemala ones in having the border of the wings rather darker and less rufescent.

Our description is based upon Guatemalan examples.

2. *Pteronymia alcmena*. (*Ithomia alcmena*, Tab. V. fig. 1.)

Ithomia alcmena, Godm. & Salv. P. Z. S. 1877, p. 61¹.

P. tigrani similis, sed minor et alarum marginibus latioribus et omnino fuscis, maculis (una nigra, altera alba) anticarum ad cellulæ finem majoribus et magis oblique positis: subius alarum marginibus paulo obscurioribus quam in *P. tigrane* et maculis albis apicalibus fere obsoletis.

Hab. GUATEMALA Choctum (*Hague*¹).

We possess a single female example of this species, found in a large collection sent us from Choctum in Northern Vera Paz. Its right position must remain doubtful until male examples have been examined. In the meantime it seems probable that it will prove allied to *P. tigranes*.

3. *Pteronymia alope*, n. sp.

P. alettæ (vide infra) quoad alarum colores valde similis, sed anticarum margine interno nigro distinguenda, ramum posticarum radialem superiorem quoque habet.

Hab. PANAMA, Lion Hill (*M^cLeannan*).—VENEZUELA.

Of this species we have three specimens, one of which was received direct from M^cLeannan, one is said to be from Venezuela, and the third from Mexico; but this last must at present be considered of very doubtful origin. The species is very like *P. aletta* in general coloration, but may be distinguished by the black inner border to the primaries. A more important character is the presence in the male of an upper radial in the secondaries, which, just as in *P. tigranes*, appears as a small branch to the subcostal.

b. Secondaries of male with upper radial wholly absent.

4. *Pteronymia cotytto*.

Heliconia cotytto, Guér. Icon. Règne An. Ins. texte, p. 471¹.

Ithomia cotytto, Hew. Ex. Butt., *Ith.* t. xiii. f. 76².

Alis hyalinis, venis nigris divisis, anticis plaga subquadrata apud cellulæ finem, apice lato et marginibus fusco-nigris, costa ad basin ferruginea, vitta extra cellulam obliqua a costa ad medium marginis externi tracta alba: subtus sicut supra, sed colore fusco paginæ superioris ferrugineo tincto.

Hab. MEXICO¹, Oaxaca (*Fenochio*), Cordova (*Rümeli*); BRITISH HONDURAS, Corosal (*Rowe*), Cockscomb Mountains (*Blancaneau*); GUATEMALA, Motagua valley (*F. D. G. & O. S.*), Polochic valley, Chisoy valley, San Gerónimo, and Choctum (*Ilague*); PANAMA, Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—VENEZUELA².

This common Central-American species was first described from Mexican specimens by Guérin-Méneville¹; and it was subsequently figured by Hewitson from a Venezuelan insect. Though we have traced the range of *P. cotytto* to Panama, we have never seen any examples from beyond the limits of Central America. Within this border it seems to be found nearly universally with the exception of Costa Rica, where *P. parva* seems to take its place. From this latter species it is readily distinguishable by the black of the apex cutting straight across the wing instead of following the curve of the margin.

Our description is taken from a Guatemalan example captured in the valley of the Rio Polochic.

5. *Pteronymia parva*. (*Ithomia parva*, Tab. V. fig. 2.)

Ithomia parva, Salv. Ann. & Mag. Nat. Hist. ser. 4, iv. p. 168¹.

Pteronymia parva, Butl. & Druce, P. Z. S. 1874, p. 332².

P. cotyttoni similis, sed minor, anticarum apicibus magis hyalinis margine nigro augustiore: subtus apicibus atomis albis, anticarum tribus, posticarum una, ornatis.

Hab. COSTA RICA (*Carmioli*¹, *Van Patten*²).

This common Costa-Rica species seems to take the place of its near ally *P. cotytto* in that country, as we have seen many of the former, but none of the latter, from there. The difference between the two is slight, but, so far as we are aware, constant.

Our figure and description are taken from the typical specimens.

6. *Pteronymia artena*.

Ithomia artena, Hew. Ex. Butt., *Ith.* t. xiii. f. 48¹.

P. simplici similis, sed alarum marginibus latioribus, macula apud cellulæ finem latiore, maculaque alba extracam majore distinguenda: subtus alarum apicibus obsoleto albo punctatis.

Hab. MEXICO ¹ (*Sallé*), Jalapa (*Deppe*, *Mus. Berol.*).

Hewitson's description and figure of this species were taken from Mexican specimens, whence we have an example brought by Mons. Sallé. Five others from that country have also come under our notice, which were obtained by Deppe, and are now in the Berlin Museum. There is nothing in Hewitson's description or figure to enable us to determine with certainty whether the name *Ithomia artena* was applied to the present insect, in which the upper radial of the secondaries is wholly absent, or to *P. tigranes*, in which this nervure appears as a branch to the subcostal; but as the former alone has, so far as we know, been found in Mexico, and not the latter, we are probably correct in applying the name *P. artena* to the Mexican species.

Our description is taken from a male specimen from Southern Mexico, captured by Mons. Sallé.

7. *Pteronymia simplex*. (*Ithomia simplex*, Tab. III. fig. 20.)

Ithomia simplex, Salv. Ann. & Mag. Nat. Hist. ser. 4, iv. p. 168¹.

Pteronymia simplex, Butl. & Druce, P. Z. S. 1874, p. 332².

Alis hyalinis, venis nigris divisis et margine angusto rufescenti-fusco circumdatis, linea angusta (in fomina latiore) eodem colore apud cellulæ finem et macula alba extra eam ad costam fere attingente: subtus sicut supra, sed partibus paginæ superioris obscuris rufescentioribus.

Hab. COSTA RICA (*Carmiol* ¹, *Van Patten* ²), Irazu (*Rogers*); PANAMA, Chiriqui (*Arcé*).

This close ally of *P. artena* seems restricted in its range to the mountainous parts of Costa Rica and the adjoining district of Chiriqui, beyond which limits we have not yet met with it. From *P. artena* it differs chiefly in the dark margin of the wings being narrower, and the black mark at the end of the cell being a narrow line just covering the discocellular nervules. The female of *P. simplex* almost exactly resembles the male of *P. artena*, and can only be distinguished by the sexual difference of neurulation. In Colombia *Ithomia apia*, Feld., seems to take its place, an insect questionably distinct from *P. artena*.

8. *Pteronymia rufocincta*. (*Ithomia rufocincta*, Tab. III. fig. 21.)

Ithomia rufocincta, Salv. Ann. & Mag. Nat. Hist. ser. 4, iv. p. 167¹.

Alis hyalinis, venis rufis divisis et rufo marginatis, macula eodem colore lineari apud cellulæ finem, margine anticarum interno stria nigra ornato: subtus sicut supra, sed coloribus rufis dilutioribus.

Hab. MEXICO, Oaxaca (*Fenochio* ¹), Putla (*Rébouch*).

A very distinct species, with the neurulation of *P. artena* and *P. simplex*, the range of which seems restricted to Western Mexico.

Our figure and description are taken from the type specimens from Oaxaca.

9. *Pteronymia notilla*.

Pteronymia notilla, Butl. & Druce, Cist. Ent. i. p. 96¹; P. Z. S. 1874, p. 332²; Butl. Lep. Ex. p. 140, t. 1. f. 7³.

Pteronymia olyrilla, Butl. & Druce, Cist. Ent. i. p. 96⁴; P. Z. S. 1874, p. 332⁵; Butl. Lep. Ex. p. 140, t. 1. f. 6⁶.

♂. Alis hyalinis, anticis venis nigris divisis et nigro circumcinctis, margine interne basin versus vix fulvescenti tincto, area interna fumosa apud cellulæ finem obscuriore, parte apicali maculis pallidissimis flavis (una subquadrata extra cellulam, tribus inter eam et marginem externum et sex submarginalibus) notata; posticis pallide ferrugineis nigro extus marginatis: subtus ut supra, sed anticis (in apice) tribus, posticis quinque (in margine externo) atomis albis ornatis; antennis nigris.

♀ mari similis, sed coloribus lætioribus, maculis anticarum flavis magis distinctis et cellulæ apud finem macula indistincta flavida notata.

Hab. COSTA RICA (*Van Patten*¹⁴), Irazu, Caché, and Rio Sucio (*Rogers*).

The sexes of this insect were described as distinct species by Messrs. Butler and Druce¹⁴, who compared the female with *Ithomia donella*, Feld. (of which *I. alinda*, Feld., is the male), and the male with *I. latilla*, Hew. With the former of these insects *P. notilla* is allied; but the latter belongs to a different section of *Ithomia*, in which the upper discocellular nervule of the secondaries is wanting, and the upper radial appears as a branch to the subcostal. In *P. notilla*, as in *P. alinda*, both the upper discocellular and the upper radial are absent. In *P. alinda* both the costal and subcostal nervures are contorted, being simple curves in *P. notilla*; besides, the inner margin of the primaries is rufous in the former and black in the latter insect, so that the two are really easily recognized species.

P. notilla appears to be a common butterfly in Costa Rica, but has not yet been met with outside the limits of that Republic.

10. *Pteronymia fulvescens*, n. sp. (Tab. IV. figg. 8, 9.)

Ithomia latilla, Butl. & Druce, P. Z. S. 1874, p. 332¹ (nec Hew.).

P. fulvimargini similis, sed antennarum tertia parte apicali flava, posticarum linea submarginali fulva valde indistincta et femine area posticarum interna fulvescenti perfusa distinguenda.

Hab. COSTA RICA (*Van Patten*¹), Rio Sucio, Irazu, and Caché (*Rogers*).

This species has nearly the coloration of *Ithomia latilla*, Hew., but differs from it in the absence in the secondaries of the upper radial, which in *I. latilla* appears as a branch to the subcostal. The yellow tips to the antennæ and other characters distinguish it from *P. fulvimargo*. We have only seen Costa-Rican examples of the species, where, however, it would seem to be a common insect.

11. *Pteronymia fulvimargo*.

Pteronymia fulvimargo, Butl. & Druce, Cist. Ent. i. p. 97¹; Butl. Ex. Lep. p. 140, t. 50, f. 5.

Alis fusco-flavidis hyalinis, venis divisis et fusco-nigro anguste circumcinctis; macula anticarum ad cellulæ finem eodem colore, area apicali maculis flavis valde indistinctis notata; venis subcostali et mediano rufis; posticarum margine nigro præcipue ad angulum analem fulvis: subtus sicut supra, sed marginibus fulvescentioribus et anticarum apicibus, posticarum marginibus externis albo punctulatis; antennis omnino nigris.

♀ mari quoad colores fere similis.

Hab. COSTA RICA (*Van Patten*¹).

This insect is a close ally of *P. fulvescens*, having the same wing-structure and a general similarity of colour-pattern. It can at once be distinguished by the antennæ being quite black; whereas in *P. fulvescens* these organs are yellow for the terminal third of their length. Van Patten's collection contained several examples of this species; but we have not met with it elsewhere.

12. *Pteronymia aletta*.

Ithomia aletta, Hew. Ex. Butt., *Ith.* t. vi. f. 31¹.

Alis subhyalinis, anticarum dimidio basali (præter costam ipsam nigram) læte rufescente, dimidio apicali fumoso-fusco venis nigris diviso, margine externo et interno ad angulum analem et macula subquadrata apud cellulæ finem nigris, parte apicali maculis serie duplici pallidissime flavis ornata—una extra cellulam (macula costam proxime albicante), altera submarginali; posticis rufescentibus apicem versus hyalinis et venis nigris divis, margine quoque nigro ornatis: subtus sicut supra, sed anticarum apice et posticarum margine externo punctulis albis notatis, linea posticarum subcostali nigra; antennis omnino nigris.

♀ mari similis, sed coloribus lætioribus.

Hab. PANAMA, Veraguas (*Arcé*).—COLOMBIA; VENEZUELA¹.

We have a single male Veraguan example of this species agreeing accurately with Colombian and Venezuelan specimens. The species was described from Venezuelan insects¹.

Our description of the male is taken from the Panama specimen, that of the female from a Colombian one.

13. *Pteronymia agalla*, sp. n. (Tab. IV. figg. 6, 7.)

P. alettae similis, sed macula magna extra cellulam flava ornata et area posticarum interna venis inclusis fere unicolori rufescente; antennis omnino nigris.

Hab. COSTA RICA (*Van Patten*); PANAMA, Chiriqui (*Arcé*), Veraguas (*Arcé*).

Though Van Patten's Costa-Rica collection contained several examples of this species, it is not included in Messrs. Butler and Druce's paper. It is closely allied to *P. aletta*, both in colour and in the structure of its wings; but the differences given above are sufficient to distinguish the two. *P. agalla* probably takes the place of *P. aletta* in Costa Rica and its vicinity.

ITHOMIA.

Ithomia, Hübner, Verz. bek. Schm. p. 9 (1816), partim.

Dynothea, Reakirt, Pr. Ent. Soc. Phil. v. p. 222.

Costa of secondaries of male rather highly arched; lower discocellular placed at nearly a right angle to the third segment of the median nervure, and bent to a small obtuse angle, where a rudimentary recurrent nervule is emitted; middle discocellular long; upper discocellular directed outwards, meeting the subcostal at a wide obtuse angle; proximal segment of subcostal slightly longer than the three segments of the median nervure; costal and subcostal nervures enclose an elliptical space, the long axis of which is about one third the length of the subcostal nervure.

Of the four species included by Hübner in his genus *Ithomia*, the most desirable in many respects to retain as the type of the genus is *Ithomia drymo*, a species which has the neururation of the secondaries arranged as described above, and in which the peculiar elliptical space included between the costal and subcostal nervures is plainly indicated. This character is quite diagnostic of the genus, any member of which can at once be recognized by reference to it alone.

The genus *Ithomia* as thus restricted contains about thirty-five species, of very varied pattern of coloration and form of wing, but with a common type of neururation. Nine species are found within our limits, of which only two occur in Mexico and Guatemala, the rest being peculiar to Costa Rica and the adjoining countries, or else southern species passing within our boundary.

1. *Ithomia panamensis*. (*Ithomia lycaste*, Tab. V. fig. 3.)

Ithomia iphianassa, var. *panamensis*, Bates, P. Z. S. 1863, p. 244, t. 29. f. 5¹; Reak. Pr. Ent. Soc. Phil. v. p. 219².

Papilio lycaste, Fabr. Ent. Syst. iii. p. 161³?

Ceratinia lycaste, Reak. l. c. p. 218, partim⁴.

Ceratinia boucardi, Druce, Ent. M. Mag. xii. p. 126⁵.

Alis nigris, basi fulvis, anticis plaga magna subtriangulari costam fere attingente, per cellulam transeunte et ad angulum analem extendente, maculis sex submarginalibus, et duabus (interdum quatuor) area apicali nigra positis, flavis, alarum basi fulvarum macula in cellulæ media et dimidio apicali posticarum nigris: subtus ut supra, sed maculis submarginalibus albis majoribus.

Hab. PANAMA, Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—COLOMBIA.

Mr. Bates, who first described this insect from a single specimen sent us by James M^cLeannan¹, considered it to be an extreme form of *I. iphianassa*; but an examination of a large series of examples shows that the peculiarities of *I. panamensis* are shared in common by all the individuals of the district, and that it is really a sufficiently well-marked form to deserve a name. The large triangular yellow spot on the middle of the primaries at once distinguishes it from all its allies. In coloration it has the pattern of *Callithomia panamensis*, *Ceratinia cleis*, and *Mechanitis macrinus*—all Panama species.

Mr. Reakirt, in a careful examination of the races of *Ithomia iphianassa* and its allies^{2 4}, identified specimens he had received from Los Angeles, California, with the *Papilio lycaste* of Fabricius³, from which Panama specimens hardly differ, if they do at all. Whether the name *P. lycaste* is really applicable to this insect is, we think, open to question. Mr. Butler, who had access to Jones's unpublished drawings, when compiling his 'Catalogue of Fabrician Rhopalocera,' applied the name to a specimen of *Callithomia* in the British Museum, which may have been Fabricius's type, who described an insect in Drury's collection. Many of Drury's specimens were purchased by Milne when this collection was sold by auction; and it was from Milne that the *Callithomia* in question was acquired by the British Museum. As the question cannot now be settled satisfactorily, we think it best to use the name *I. panamensis*, upon which no doubts rest. Los Angeles in California is a very long way from the usual range of this species; and it seems possible that some error has been made in the locality attributed to the specimens received from there by Mr. Reakirt. So far as our knowledge of the insect goes, its range is restricted to the Colombian States of Panama and Antioquia.

2. *Ithomia heraldica*. (Tab. V. fig. 4.)

Ithomia heraldica, Bates, Ent. M. Mag. iii. p. 51¹; Butl. & Druce, P. Z. S. 1874, p. 333².

Alis anticis fusco-nigris, fascia plerumque semihyalina et rufo marginata a basi prope angulum analem extendente, macula obliqua subquadrata cellulam transeunte, altera elongata infra eam inter ramos medianos secundum et tertium, una subapicali tripartita punctisque apicalibus quatuor flavis; posticis fulvis interno semipellucidis, margine externo fusco indistincte punctulato: subtus ut supra, sed anticis punctis apicalibus albidis, posticarum margine septem punctis albis notato, costæ basi et corpore infra sulphureo tinctis; antennis basi nigris, apice flavis.

Hab. NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA¹ (*Van Patten*²), San Francisco, Caché (*Rogers*); PANAMA, Veraguas (*Arcé*).

A species allied to *I. iphianassa*, but quite distinct from any of the forms of that insect. It was first described from specimens from Costa Rica¹, where it would appear to be common. It is equally common in Nicaragua, having been obtained by all collectors who have worked in the mining-district of Chontales. We have only a single specimen from the State of Panama; we therefore conclude that it hardly passes beyond the limits of Costa Rica in that direction.

3. *Ithomia plaginota*.

Ithomia plaginota, Butl. & Druce, Cist. Ent. i. p. 95¹; Butl. P. Z. S. 1874, p. 333²; Butl. Lep. Ex. p. 139, t. l. f. 4³.

Alis fulvis, anticis macula subrotunda discali, altera plerumque subtriangulari infra eam et dimidio apicali nigris, fascia obliqua irregulari cellulam transeunte, altera extra eam tripartita septemque punctis submarginalibus flavis; posticarum apicibus nigro anguste marginatis: subtus sicut supra, sed limbo posticarum nigro flavo punctulato et area discali macula nigrescente notata.

BIOL. CENT.-AMER., Rhopal., Vol. 1, Nov. 1879.

II

Hab. COSTA RICA (*Van Patten*^{1 2 3}); PANAMA, Chiriqui (*Ribbe*).

This is a well-marked species, restricted in its range to Costa Rica and the adjoining district of Chiriqui. Its nearest ally is *I. celemia*, Hew., of Colombia, from which it differs in having all the spots on the apical half of the primaries yellow instead of white.

4. *Ithomia xenos*. (Tab. V. fig. 8.)

Dircenna xenos, Bates, Ent. M. Mag. iii. p. 50¹; Butl. & Druce, P. Z. S. 1874, p. 332².

Alis flavido-hyalinis, anticis præcipue apud venas fumatis, macula fumata obliqua cellulam transeunte, altera ad finem ejus marginibusque anguste nigris, margine interno lato nigro, vena mediana anticarum et venis posticarum omnibus rufis: subtus ut supra, sed pallidiore, posticarum limbo externo albo punctulato, costa fascia elongata rufa utrinque grisea picta.

♀ mari similis, sed maculis anticarum fumatis saturatioribus et posticis interne magis rufescentibus distinguenda.

Hab. COSTA RICA (*Carmiol*¹, *Van Patten*²), Irazu (*Rogers*); PANAMA, Chiriqui (*Zahn*).

Mr. Bates, when describing this species, referred it to the genus or section *Dircenna*¹; but a further examination of the type specimens and others that have reached us shows clearly that the neuration is strictly that of the section in which we now place it, and that its resemblance to *Dircenna* is at most superficial. Though apparently a very common species in Costa Rica, we have seen but few specimens from beyond the limits of that country. It has no very near ally that we know of; but it comes nearest *I. lagusa*, Hew., of the northern parts of Colombia.

5. *Ithomia patilla*. (*Ithomia cotytto* (lapsu), Tab. V. fig. 6.)

Ithomia patilla, Hew. Ex. B., *Ith.* t. ii. f. 2¹; Butl. & Druce, P. Z. S. 1874, p. 333².

Ithomia psyche, Bates, Ent. M. Mag. i. p. 34³.

Alis hyalinis, venis nigris divisis, et marginibus (anticarum apicibus late) nigrescenti circumdatis; plaga magna subquadrata nigra apud anticarum cellulæ finem sæpe margine externo cum ramo mediano secundo late nigro conjuncto, altera extra eam alba costam fere attingento; margine posticarum nigro intus sæpe ferrugineo: subtus ut supra, sed coloribus obscuris multo dilutioribus et rufescentioribus, costæ posticarum basi et abdomine infra sulphureis; posticarum apicibus albo bipunctulatis; antennis nigris, prothorace rufo.

Hab. MEXICO¹, Oaxaca (*Fenochio*), Cordova (*Rümeli*), Vera Cruz (*Deppe*, *Mus. Berol.*); BRITISH HONDURAS, Cockscomb Mountains (*Blancaneau*); GUATEMALA, Retalhuleu (*F. D. G. & O. S.*), Volcan de Atitlan (*O. S.*), Zapote (*Champion*), Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*, *Janson*); COSTA RICA (*Van Patten*²), San Francisco, Caché (*Rogers*); PANAMA, Chiriqui (*Zahn*), Veraguas (*Arcé*), Lion Hill (*M'Leannan*).

One of the commonest species of its family in Central America, being especially abundant in Guatemala, where we found it in most of the low-lying forest country on

both sides of the Cordillera. It was also observed in the forests of the Volcano of Atitlan at an elevation of between 3000 and 4000 feet. Our specimens from Retalhuleu were described by Mr. Bates as *I. psyche*³, and compared at the time with *I. victorina* and *I. cotytto*, species having a very similar outward resemblance to it, but differing, as Mr. Bates pointed out, in the arrangement of the neuration of the secondary wings. Subsequent comparison has shown us that *I. psyche* does not differ specifically from *I. patilla* (a Mexican insect described by Hewitson from apparently a female example¹), though Guatemalan and southern specimens have the inner portion of the dark border to the secondaries tinged with rufous, but to a variable degree.

We have not yet seen specimens of *I. patilla* from any locality beyond the Isthmus of Panama; but in South America allied species occur, the nearest perhaps being *I. ardea*, Hew., of Peru and Bolivia.

Our figure is taken from one of the types of *I. psyche*, captured near Retalhuleu in 1862.

6. *Ithomia leila*. (Tab. V. fig. 7.)

Ithomia leila, Hew. Ex. B., *Ith.* t. ii. f. 3¹.

I. patillæ affinis, sed alis posticis multo minoribus, anticis macula elliptica pellucida nigro circumcincta intra ramos medianos secundum et tertium distinguenda.

Hab. MEXICO¹, Jalapa (*Deppe*, *Mus. Berol.*); GUATEMALA, Choctum (*Hague*).

Of this rare species but little is known. Hewitson's plate was drawn from a female specimen in Saunders's collection, said to have come from Mexico. From the same country we have seen two examples captured by Deppe at Jalapa, which are now in the Berlin Museum. Only three specimens have reached us from Guatemala, two of which were taken near Choctum, in Northern Vera Paz, by one of Mr. Hague's collectors. The third we procured from Herr Ribbe, from a collection of Guatemalan insects. Our Choctum specimens are both males; and from one of them the figure has been drawn.

7. *Ithomia hippocrenis*. (Tab. V. fig. 5.)

Ithomia hippocrenis, Bates, Ent. M. Mag. iii. p. 51¹; Butl. & Druce, P. Z. S. 1874, p. 333².

I. patillæ similis, sed minor, apicibus anticarum magis hyalinis et stria acuta angusta per mediam cellulam versus ramum medianum primum ducta distinguenda.

Hab. NICARAGUA, Chontales (*Belt*, *Janson*); COSTA RICA (*Van Patten*)²; PANAMA, Santa Fé, Calobre (*Arcé*), Lion Hill (*M'Leannan*)¹.

Originally described by Mr. Bates from a single specimen sent in from Lion-Hill station by the late James M'Leannan; we have since received a number of others

from more northern localities. It does not, however, pass beyond Nicaragua in its northern range. In Colombia its place is taken by an allied species, *I. diasia*, Hew., to which it has a great general resemblance, differing, however, in having the quadrate spot at the end of the cell of the primaries larger, and in the dark marks of the underside being suffused with rufous.

Our figure is taken from the type specimen sent us from Lion Hill.

8. *Ithomia terra*.

Ithomia terra, Hew. Ex. B., *Ith.* t. iii. f. 16¹; Butl. & Druce, P. Z. S. 1874, p. 333².

I. patilla affinis, sed minor et anticarum apicibus angustius nigris, plaga alba minus obvia, vena mediana posticarum inter ramos secundum et tertium et ramis ipsis late nigris distinguenda.

Hab. COSTA RICA (*Van Patten*²), Caché (*Rogers*); PANAMA, Calobre (*Arcé*).—COLOMBIA¹; VENEZUELA; ECUADOR.

This southern species, described originally from Colombian specimens, ranges in Central America as far as Costa Rica, whence numerous examples have reached us. But little variation is observable in specimens from distant points in the range of the species; Central-American examples, however, show a faint extracellular white spot on the primaries, hardly visible in insects of more southern origin.

9. *Ithomia jucunda*. (Tab. II. fig. 3.)

Ithomia jucunda, Godm. & Salv. Ann. & Mag. N. H. ser. 5, ii. p. 258.

I. terra similis, sed macula ad cellulæ anticarum finem majore et angulo anali per ramum medianum late nigrum conjuncta, maculaque rufa in margine late nigro posticarum posita distinguenda.

Hab. PANAMA, Candelaria (*Ribbe*, *Mus. Staudinger*).

Two specimens of this *Ithomia*, obtained by Herr Ribbe are in Dr. Staudinger's collection, and are the only ones we have seen. Both are females; and therefore the position of the species in the genus *Ithomia* is somewhat doubtful; but we believe it to be a near ally of *I. terra*.

Our figure and description are taken from one of the types.

HYPOLERIA (gen. nov.).

Lower discocellular of secondaries of male directed across the wing and atrophied at its upper end, not meeting the middle discocellular; middle and upper discocellulars and upper radial strong, the latter not uniting with the subcostal at its distal end; lower radial very slender, a small recurrent nervule attached to its proximal end. Costal and subcostal divergent in the middle, where they enclose an elliptical space, which, however, is not closed at its distal end (Section *a*); or costal and subcostal lying close together throughout their length (Section *b*).

Secondaries of the female in Section *a* with the middle discocellular very short, upper

discocellular absent, the upper radial being a branch of the subcostal; female of Section *b* unknown.

(Types: Sec. *a*, *H. libera*, nob.; Sec. *b*, *Ithomia polissena*, Hew.)

This genus has many of the characters of *Hymenitis*, but differs in not having one of the peculiarities of that genus, in which the upper radial and subcostal of the secondaries in the male unite at their extremities, instead of running free to the margin as in the present genus. Five species of the group appear to belong to Central America; but the limits of the genus in South America we have not yet been able to ascertain. Of these five species, *H. libera* and *H. cassotis* are certainly congeneric; the position of *H. fumosa* must remain doubtful until male examples have been examined, so also must that of *H. rhene*, of which we have no specimen at hand for reexamination; the fifth, *H. polissena*, is aberrant, inasmuch as the costal and subcostal nervures of the secondaries of the male lie close together, instead of diverging to enclose an elliptical space as in *H. libera*.

a. Costal and subcostal nervures of secondaries of male divergent in the middle, where they embrace an elliptical space not closed at its distal end.

1. *Hypoleria libera*, n. sp. (Tab. IV. figg. 12, 13.)

♂ alis anticis sordide hyalinis, costa, marginibus, macula subquadrata apud cellulæ finem et venis nigris, dimidio apicali maculis decem pellucido-albis ornato (tribus conjunctis ultra cellulam); posticis dimidio inferiore rufescento, reliquo pellucido venis nigris diviso, margine externo fusco: subtus sicut supra, sed posticarum costa rufo notata.

♀ mari similis, sed obscurior, maculis anticarum hyalinis minoribus, posticis fere omnino rufis.

Hab. PANAMA, Chiriqui, Calobre, and Santa Fé (*Arcé*), Lion Hill (*M. Leannan*).

This is a local race of *Ithomia lavinia*, Hew., a species found in Colombia as far north as the neighbourhood of Santa Marta. The Central-American race differs constantly in the greater distinctness of the dark marks of the male, and in the female also being darker and the secondaries of a duller red, which is more generally suffused over the wing. *H. libera* has a very limited range in Central America, being not found outside the State of Panama.

Our descriptions and figures are taken, that of the male from a specimen captured at Lion Hill, that of the female from a Calobre example.

2. *Hypoleria fumosa*, n. sp. (Tab. IV. fig. 14.)

♀ *H. libere* similis, sed alis anticis fusciscentioribus, maculis apicalibus nullis, fascia ultra cellulam magis distincta, posticis fumoso-rufescenti tinctis: subtus ut supra, sed posticarum costa fulvo tincta.

Hab. PANAMA, Santa Fé (*Arcé*).

The description and figure of this species are taken from a single female specimen sent us from Santa Fé by *Arcé*. This differs so much from *H. libera* that we cannot but consider it distinct. The position of the species must remain somewhat doubtful until males of it have been examined.

3. *Hypoleria cassotis*. (Tab. V. fig. 10.)

Ithomia cassotis, Bates, Ent. M. Mag. i. p. 35¹.

Hymenitis cassotis, Butl. & Druce, P. Z. S. 1874, p. 334².

Alis hyalinis, venis nigris divisis et fusco-nigro circumcinctis, anticarum margine ad apicem latiore, macula subtrigona ad cellulæ finem et ultra eam vitta alba a costa ad marginem externum transeunte, apicibus interdum maculis fere obsoletis albis notatis: subtus ut supra, sed partibus fuscis fulvo tinctis; antennis nigris.

Hab. GUATEMALA, Choctum and forests of N. Vera Paz (*F. D. G. & O. S.*), Polochic valley and Chisoy valley (*Hague*); COSTA RICA (*Van Patten*²), Irazu and Caché (*Rogers*).

This species was first described by Mr. Bates, from specimens obtained by us near Choctum¹, in the forests of Northern Vera Paz, not the Motagua valley, as stated in the original description; and from the former districts, as well as from the Polochic and Chisoy valleys, we have received several other specimens through Mr. Hague's exertions. The species, however, cannot be called common in Guatemala; and its range seems confined to the hot districts which are situated at a less elevation than 2000 feet. In Costa Rica it would appear to be a commoner insect, as Van Patten's collection contained many examples, and we have also received it from Mr. Rogers.

Our figure and description are taken from a female captured in the forests of Choctum.

4. *Hypoleria rhene*. (*Ithomia rhene*, Tab. II. fig. 6.)

Ithomia rhene, Godm. & Salv. Ann. & Mag. Nat. Hist. ser. 5, ii. p. 259¹.

H. cassotis quoad colores similis, sed posticarum cellula valde elongata, ramo radiali inferiore brevissimo.

Hab. PANAMA (*Ribbe*, *Mus. Staudinger*¹).

A single male example of this insect is the only one we have seen. This was obtained by Herr Ribbe in the neighbourhood of Panama, and is now in Dr. Staudinger's collection.

Our description is taken from this type, as well as our figure, and we are indebted to Dr. Staudinger's kindness for the loan of it for this purpose.

b. Costal and subcostal nervures of secondaries of male lying close together throughout their length.

5. *Hypoleria polissena*.

Ithomia polissena, Hew. Ex. Butt., *Ith.* t. xxiv. fig. 151¹.

Alis hyalinis, venis nigris divisis et fusco-nigro angustissime circumcinctis, macula eodem colore sublineari ad cellulæ finem et punctulo ultra eam in costa albo notato: subtus ut supra, sed colore opaco rufo tincto.

Hab. PANAMA, Chiriqui (*Ribbe*, *Mus. Staudinger*).—ECUADOR¹.

Herr Ribbe took a single specimen of this species at Chiriqui; and this, through Dr. Staudinger's kindness, we had an opportunity of comparing with an example from

Ecuador in our collection, and found them to agree exactly. We have no other evidence of the existence of the insect in Central America.

PSEUDOSCADA (gen. nov.).

Lower discocellular of secondaries of male placed at right angles to the third segment of the median nervure, slightly curved and atrophied at its upper end, lower radial very slender; middle and upper discocellular, upper radial, and subcostal very strong; costal nervure atrophied, scarcely perceptible as a spur on the subcostal at about one third of its length from the base; ends of upper radial and subcostal free, not uniting as in *Hymenitis*. Three discocellular nervules present in the female; both upper and lower radials with separate origin. Tarsus of front leg of female with five joints, a pair of spurs on each of the first, second, and third joints. (Type *Ithomia pusio*, Godm. & Salv.).

Though at first sight very similar in structure to *Hymenitis*, this genus presents so many differences that its separation seems necessary. The atrophy of the costal nervure in the secondaries of the male is not found in any other group, so far as we know; and the subcostal and upper radial having free ends is another divergence from *Hymenitis*, from which it also differs in the neururation of the secondaries of the female, which (in *Pseudoscada*) has the full complement of nervules.

1. *Pseudoscada utilla*. (*Ithomia pusio*, Tab. V. figg. 13, 14.)

Ithomia utilla, Hew. Ex. Butt., *Ith.* t. xvii. f. 101¹.

Ithomia pusio, Godm. & Salv. P. Z. S. 1877, p. 61².

Alis hyalinis, venis nigris divisis et fusco-nigro circumdatis (ad apicem anticarum paulo latiore), macula subtrigona ad cellulæ finem vittaque obliqua alba ultra eam a costa orga marginem externum extensa: subtus ut supra, sed coloribus opacis ferrugineis, anticarum apicibus atomis duabus minutis albis pictis.
♀ mari similis, sed alarum marginibus paulo latioribus.

Hab. NICARAGUA, Chontales (*Belt, Janson*²); COSTA RICA (*Van Patten*), Irazu (*Rogers*); PANAMA, Veraguas (*Arcé*).—COLOMBIA¹; ECUADOR.

When describing *Ithomia pusio*², we compared it with *Ithomia andronica*, Hew., a species to which, except in its smaller size, it has a strong outward resemblance. A further examination of its wing-structure shows that its relationship with *I. andronica* is not really at all near, and that it cannot be separated specifically from *I. utilla*, Hew., under which name we now place the insect.

A common species in Nicaragua and Costa Rica, *P. utilla* is absent from the line of the Panama railway, but reappears again in South America, being found both in Colombia and Ecuador.

Our descriptions and figures are taken from Nicaraguan specimens, the types of *I. pusio*.

HYMENITIS.

Hymenitis, Hübner, Verz. bek. Schm. p. 8 (1816).

Lower discocellular of secondaries of male placed at right angles with the third section of the median nervure, and atrophied at its upper end; middle and upper discocellulars short but strong; upper radial strong, uniting with the subcostal close to its distal end; lower radial slender, sometimes atrophied at its proximal end. Tarsus of front leg of female with five joints, a pair of spurs on each of the first, second, and third joints. *Female*. Section *a*: secondaries with a long lower discocellular; middle discocellular absent; upper discocellular very short, directed outwards; lower radial branching from the upper about halfway between the cell and the margin. Section *b*: secondaries with lower discocellular curved near its upper end; middle discocellular meets the subcostal at an acute angle; upper discocellular absent; lower radial distinct; upper radial branches from the subcostal a little beyond the cell.

(Species described: Section *a*, *H. oto* (Hew.); Section *b*, *H. sosunga*, Reak.)

The females of these two sections have very different structures in their secondary wings; and it may prove necessary to give them generic rank; but as we have not yet been able to examine the South-American species with sufficient accuracy to enable us to ascertain the limits of each section, we prefer keeping them all under the name *Hymenitis* for the present.

The wing-structure of the secondaries of the males is the same in both sections, except that in *H. oto* and its allies the radials are crowded closer to the subcostal than in the *H.-sosunga* group.

The genus *Hymenitis* has a wide range in South America, being found in Southern Brazil, and throughout the eastern valleys of the Andes to Colombia, extending northwards to Mexico, eight species being found within our limits.

- a*. Secondaries of female with a long lower discocellular; middle discocellular absent; upper discocellular very short and directed outwards; lower radial branching from the upper about halfway between the cell and the margin.

1. *Hymenitis oto*.

Ithomia oto, Hew: Ex. Butt., *Ith.* t. vii. f. 39¹.

Hymenitis oto, Butl. & Druce, P. Z. S. 1874, p. 333².

Alis hyalinis, venis nigris divisis et fusco-nigro circumcinctis (posticarum margine rufescentiore) ad apicem et ad finem rami mediani secundi multo latiore, macula subquadrata ad cellulæ finem vittaque ultra eam a costa fere ad marginem internum extensa albis: subtus ut supra, sed coloribus paginae superioris opacis rufis.

♀ mari similis, sed macula anticarum et marginibus fuscis latioribus.

Hab. MEXICO, Cordova (*Rümeli*), Oaxaca (*Fenochio*); BRITISH HONDURAS, Cockscomb Mountains (*Blancaneau*); GUATEMALA, Retalhuleu, Volcan de Fuego, 6400 feet (*F. D. G. &*

O. S.), Zapote (*Champion*), Chuacus, San Gerónimo, and Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²), San Francisco (*Rogers*); PANAMA, Chiriqui and Calobre (*Arcé*).

Originally described from Guatemalan specimens¹, this species is now known to have a wide range in Central America, being found from Southern Mexico to the State of Panama. In Guatemala it is one of the commonest species of its group, and is found at very various altitudes, from the forests of the Volcan de Fuego at a height of between 6000 and 7000 feet to as low as 900 feet at Retalhuleu; it also occurs in many other parts of the country at intermediate altitudes. In Nicaragua it seems to be not so abundant; but in Costa Rica and the adjoining parts of the State of Panama its numbers would appear to be quite equal to those in Guatemala. We have no record of its occurrence beyond the mountainous district of Calobre in Panama.

We have described Guatemalan specimens in our collection.

2. *Hymenitis nero*.

Ithomia nero, Hew. Ex. Butt., *Ith. t.* vii. f. 37¹.

Hymenitis nero, Butl. & Druce, P. Z. S. 1874, p. 333².

H. otoni affinis, sed anticearum apicibus magis hyalinis, margine fusco multo angustiore differt.

Hab. MEXICO¹, Cordova (*Rümeli*); GUATEMALA, Polochic valley, Chisoy valley, and forests of Northern Vera Paz (*Hague*), Zapote (*Champion*); COSTA RICA (*Van Patten*²); PANAMA, Chiriqui (*Arcé*, *Ribbe*).

Originally described from a Mexican specimen in Dr. Boisduval's collection, *H. nero* is by no means common in that country; and as yet we have only received a single specimen of it, which was taken near Cordova. In Guatemala it is more abundant, but still restricted in its range to the low-lying forests of Vera Paz, whence Mr. Hague has sent us a good many examples—and the forests of the Pacific side, where Mr. Champion has recently found it at Zapote, on the slopes of the Volcan de Fuego. In Costa Rica it is also a common insect; but we are somewhat surprised not to have received it from Nicaragua. This would indicate that, though *H. nero* is an inhabitant of the lower forests, it probably prefers an elevation of 1000 to 2000 feet to the country lying nearer the sea-level.

3. *Hymenitis lyra*. (*Ithomia lyra*, Tab. V. figg. 11, 12.)

Ithomia lyra, Salv. Ann. & Mag. N. H. ser. 4, iv. p. 169¹.

Hymenitis lyra, Butl. & Druce, P. Z. S. 1874, p. 333².

H. neroni persimilis, sed minor et area anticearum apicali pellucida nec fusco-hyalina, posticearum venis angustiore nigris, et anticearum feminae apicibus late nigris maculas duas indistinctas includentibus.

Hab. GUATEMALA, Polochic valley¹ and Chisoy valley (*Hague*); COSTA RICA (*Van Patten*², *Carmirol*¹), Irazu (*Rogers*); PANAMA, Chiriqui (*Zahn*), Calobre (*Arcé*).

BIOL. CENT.-AMER., Rhopal., Vol. 1, Feb. 1880.

Though like *H. nero* in the distribution of the hyaline parts of the apex of the anterior wings, *H. lyra* is really more nearly allied to the South-American *H. andronica* (Hew.), from which it chiefly differs in the larger size and different shape of the subquadrate spot at the end of the cell of the primaries.

It is a rare species in Guatemala, whence but few specimens have reached us. Costa Rica seems to be its headquarters; and here it abounds, numbers of specimens having been sent from there. It is rare again in the adjoining parts of Panama, and altogether absent from the line of railway. From this we gather that its chief resorts are woods of an elevation of not less than 2000 feet above the sea.

We have described and figured type specimens—the male from the Polochic valley, the female from Calobre, Panama.

4. *Hymenitis morgane*.

Hymenitis morgane, Geyer, Hübn. Zutr. ex. Schm. f. 869, 870¹.

Ithomia morgane, Hew. Ex. Butt., *Ith.* t. x. f. 55².

Alis hyalinis, venis, marginibus late et macula ad cellulæ anticarum finem rufescentibus; fascia cretacea sub-obsolata a costa ad marginem externum extensa: subtus ut supra.

Hab. MEXICO² (*Karwinsky*¹, *Mus. Vindob.*), Oaxaca (*Fenochio*).

Though this species has been long known as an inhabitant of Mexico, we have no precise information of its range except through the specimens sent us by Don A. Fenochio from the neighbourhood of Oaxaca. From this we infer that the species is not improbably restricted to Western Mexico.

It is a well-marked species, being easily known by its broad rufous margin.

We have described one of our Oaxaca specimens.

5. *Hymenitis anetta*.

Heliconia anette, Guér. Icon. Règn. Anim. iii. p. 470¹.

Ithomia anetta, Hew. Ex. Butt. i. Intr. p. iv².

Hymenitis anetta, Butl. & Druce, P. Z. S. 1874, p. 333³.

Ithomia telesto, Hew. Ex. Butt., *Ith.* t. x. f. 56⁴.

H. morgane similis, sed minor, alarum marginibus angustioribus et obscurioribus, fascia cretacea anticarum magis distincta distinguenda.

Hab. MEXICO^{1 4} (*Heller*, *Mus. Vindob.*); BRITISH HONDURAS, Cockscomb Mountains (*Blancaneau*); GUATEMALA, Volcan de Atitlan, Volcan de Fuego, Dueñas, Aceituno (*F. D. G. & O. S.*), Zapote (*Champion*), San Gerónimo and Polochic valley (*Haage*); COSTA RICA (*Van Patten*³, *Carmirol*), Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Arcé*).

Though apparently not common in Mexico, whence the original specimens came¹, *H. anetta* is very abundant in Guatemala, ranging from a height of 2000 feet up to

nearly 7000 feet above the sea. At Dueñas, and in the Volcan de Fuego, it is one of the commonest species, and may be seen in numbers flitting a few feet from the ground in the forests. It is equally common in Costa Rica, but is absent from Nicaragua and the lower parts of the State of Panama, mountains of at least 2000 feet or more being necessary to its habits.

Southern specimens differ slightly from northern ones in that the rufous border of the male is sometimes narrower.

We have described a Guatemalan specimen in our collection.

6. *Hymenitis furina*, n. sp. (Tab. IV. figg. 15, 16.)

Alis anticis fusco-hyalinis, costa, margine interna et plaga in cellulæ medio fusco-nigris, cellula ad basin fulvescenti-fusca, parte distali ochraceo-hyalina; vitta ultra cellulam, maculis duabus infra eam, serie submarginali et duabus apicalibus ochraceo-hyalinis; posticis fulvescentibus medialiter magis pellucida, macula ad cellulæ finem et margine externo ad apicem valde sinuato fusco-nigris.

♀ mari similis, sed major et coloribus alarum saturatioribus dignoscenda.

Obs. *Ithomia kedema*, Hew., affinis, sed major, anticarum basi fusciscentiore, et area posticarum interna saturatius fulvescente distinguenda.

Hab. PANAMA, Veraguas (*Arcé*).

This species is a close ally of *H. kedema*, but seems sufficiently distinct to be separable. We possess three specimens, all obtained in the State of Panama, and all that have come under our notice. A male and female of these are described and figured.

b. Secondaries of female with lower discocellular curved near its upper end; middle discocellular meets the subcostal at an acute angle, upper discocellular absent; lower radial distinct; upper radial branches from the subcostal a little beyond the cell.

7. *Hymenitis sosunga*. (*Ithomia sosunga*, Tab. V. figg. 15, 16, 17, 18.)

Ithomia sosunga, Reak. Pr. Ent. Soc. Phil. v. p. 217¹.

Hymenitis zavaletta, Butl. & Druce, P. Z. S. 1874, p. 333² (nec Hew.).

Alis anticis fusco-semihyalinis, macula in cellulæ medio, altera ad finem ejus et marginibus fusco-nigris; macula subquadrata cellulari, altera sinuata extra eam a costa ad angulum analem extensa et tribus subapicalibus flavo-hyalinis, maculisque tribus in margine ipso albis; posticis parte basali flavo-hyalina, parte apicali fusco-hyalina, margine externo late nigro maculis albis inclusis.

♀ mari similis, sed area posticarum interna lateritio-fulva et maculis submarginalibus albis majoribus dignoscenda.

Hab. GUATEMALA, forests of N. Vera Paz (*F. D. G. & O. S.*), Choctum and Chisoy valley (*Hague*); HONDURAS¹; NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*²); PANAMA, Volcan de Chiriqui, Santa Fé, and Calobre (*Arcé*).

We obtained several specimens of this fine species in the lowland forests of Northern

Vera Paz; and others were subsequently sent us from the same district, and also from the Chisoy valley, by Mr. Hague. It is a strictly forest species, being found only in the thin undergrowth of virgin forest, and may be seen in January and February flitting near paths.

Under slightly modified forms the species is found in Nicaragua, Costa Rica, and the adjoining parts of the State of Panama, but not on the railway line. Guatemalan specimens have the yellow of the base of the secondaries more restricted in extent than is observable in Costa-Rican and Panama specimens; but Nicaraguan examples are somewhat intermediate. There is a difference, too, in the postcellular yellow band of the primaries, which in Guatemalan examples is a large continuous spot, but in more southern specimens is more broken up into separate spots. These differences are slight; and as intermediate links are not wanting, we think it best to keep all under the name *H. sosunga*, proposed by Mr. Reakirt for a specimen which came from Honduras¹.

The male of this butterfly has a great resemblance to *Ithomia zavaletta*, Hew., in which the sexes are nearly alike. A Costa-Rica specimen was called by the latter name by Messrs. Butler and Druce²; but it doubtless ought to have been referred to this species.

Our figures 15 and 16 represent the Panama form of the species, 17 and 18 representing the Guatemalan race.

8. *Hymenitis zygia*. (*Ithomia zygia*, Tab. V. figg. 19, 20.)

Ithomia zygia, Godm. & Salv. P. Z. S. 1877, p. 61¹.

H. sosungæ affinis, sed area anticarum apicali fuscescentiore et maculis flavo-hyalinis multo minoribus; posticis margine fusco multo angustiore et area interiore ferrugineo tineta.

♀ feminae *H. sosungæ* similis, sed maculis anticarum minoribus, posticarum margine fusco multo angustiore et maculis albis submarginalibus majoribus notata.

Hab. PANAMA, Volcan de Chiriqui (*Arcé*).

This beautiful species, though surrounded by the wider-ranging *H. sosunga*, is yet quite distinct from that species. It is restricted in its range to the Volcano of Chiriqui, whence we have received several examples, most of which are females.

Our figures are taken from two of these Chiriqui examples, which were also the types of our original descriptions.

HETEROSAIS (gen. nov.).

Subcostal nervure of secondaries of male with a convex and concave curve, costal nervure forming the chord to the proximal curve; lower discocellular placed at a large acute angle to the third segment of the median nervure, at its upper end it meets the lower radial; middle discocellular and upper radial absent, leaving the cell open; upper discocellular atrophied, being represented by a slight projection on the subcostal

on its lower side. Lower discocellular of secondaries of female strongly curved and bent to a large acute angle, where a recurrent nervule is emitted; lower radial strong; middle discocellular meets the subcostal at a right angle, the upper discocellular and upper radial being absent. (Type *Ithomia nephele*, Bates.)

The neururation of the secondaries of the male of insects of this section is quite peculiar, and in this respect represents the simplest type of wing-structure to be found in the subfamily Danainæ, though *Pteronymia* is of almost as simple a construction in a different way. Taking this fact as affecting the position of *Heterosais* in the subfamily, it should perhaps stand at the head of the Rhopalocera; but, on the other hand, the presence in the female of a front leg with a five-jointed tarsus is opposed to this view. This is a point best reserved for a general review of the whole of the Danainæ, being rather beyond the scope of a faunistic work like the present.

1. *Heterosais nephele*.

Ithomia nephele, Bates, Trans. Linn. Soc. xxiii. p. 548¹; P. Z. S. 1863, p. 244².

Hymenitis nephele, Butl. & Druce, P. Z. S. 1874, p. 333³.

Alis fuliginoso-hyalinis, venis nigris divisis et fusco-nigro circumcinctis, macula subquadrata obliqua eodem colore ad cellulæ finem vittaque cretaceo-alba ultra eam a costa ad marginem externum extensa, et macula submarginali in angulo anali albescente: subtus ut supra, sed coloribus opacis rufo tinctis.

Hab. COSTA RICA (*Van Patten*³, *Carmirol*); PANAMA, Chiriqui, Santa Fé (*Arcé*), Lion Hill (*McLeannan*²).—ECUADOR; UPPER AMAZONS¹.

Heterosais nephele was first described by Mr. Bates from specimens obtained during his expedition on the Amazons at Tabatinga, near the frontier of Brazil and Peru. It has since been found in some numbers by collectors in Ecuador, in the valley of the Rio Napo and other localities on the eastern slopes of the Andes. Absent from Colombia, the species reappears in Central America, where it is found throughout the State of Panama and in Costa Rica, being especially abundant on the line of the Panama railway.

Specimens from Central-American localities are very constant in their characters, and show the peculiar nerve-structure of the secondary wings, which distinguishes this and its allies from other forms of this group of insects.

2. *Heterosais cadra*. (*Ithomia cadra*, Tab. II. fig. 5.)

Ithomia cadra, Godm. & Salv. Ann. & Mag. N. H. ser. 5, ii. p. 259.

H. nephele similis, sed margine anticarum interno rufescente et area posticarum interna (venis inclusis) rufescenti induta differt.

Hab. PANAMA, Rio Gatun (*Ribbe*).

This is a close ally of *H. nephele*, differing in the points indicated above. Two speci-

mens only have as yet come under our notice, both of which were obtained at Rio Gatun on the line of the Panama railway by Herr Ribbe. One of these is in Dr. Staudinger's collection, and one in our own.

From the latter our figure and description are taken.

Subfam. *SATYRINÆ*.

CÆROIS.

Cærois, Hübner, Verz. bek. Schmett. p. 56 (1816) ; Doubl. & Hew. Gen. Diurn. Lep. ii. p. 366, t. lxxv. f. 1. (Type *Papilio arcescilaus*, Cr., = *P. chorraineus*, Fab.)

The type of this genus is a species peculiar to Guiana and the Amazon valley, which, probably on account of the state of atrophy of the front legs of the male, has been placed at the head of the Satyrinæ. These legs, owing to the rudimentary condition of the tibia and tarsus, are very similar to those of *Ithomia* and its near allies; and this fact perhaps justifies our making *Cærois* stand here next to the Danainæ; but whether this position can be permanently assigned to it can only be determined by a more thorough examination of the Satyrinæ than we can here undertake.

Besides the type, the only other species which has been placed in the genus *Cærois* is the *Papilio gertrudtus* of Fabricius, of which we possess a mutilated example so determined by Mr. Butler after an examination of Jones's drawings, the basis of Fabricius's description. In the structure of the wings and front legs this specimen agrees with *Cærois*; so that we have no reason to dissent from Mr. Butler's decision. At the same time we cannot but regret that better materials are not forthcoming upon which to revise the question.

1. *Cærois gertrudtus*.

Papilio gertrudtus, Fabr. Ent. Syst. iii. p. 72¹.

Cærois gertrudtus, Butl. Cat. Fab. Diurn. Lep. p. 8².

Alis fuscis dimidio basali cyaneo lavatis, anticis macula subapicali fulva, ocello nigro albo pupillato ad apicem propius; subtus pallide ferrugineis, strigis obliquis ferrugineis quatuor, una ultra cellulam a costa anticarum in posticas extendente, altera brevior intra cellulam aliisque duabus corpori propioribus, ad basin quoque ferrugineo irroratis; alis posticis hujus speciminis imperfectis dimidio apicali omnino absente.

Hab. PANAMA, Lion Hill (*M^cLeannan*).

The determination of the only specimen we possess of this species is due to Mr. Butler, who refers it without hesitation to this Fabrician species². Unfortunately this example is but a fragment, possessing, however, many of the characters ascribed to the species by Fabricius, but differing in having a purple blush over both wings, a character not noticed in the original description. As our example is a male, the female may want this peculiarity and thus conform to the Fabrician diagnosis.

Our specimen was received from the late James M'Leannan, who took it at Lion Hill on the Panama railway. We have as yet looked in vain for more specimens; for none have reached us.

CALLITÆRA.

Hetæra, Div. A, Sec. I. Subsec. *b*, Doubl. & Hew. Gen. Diurn. Lep. ii. p. 363 (1851).

Callitæra, Butler, Cat. Sat. B. M. p. 101 (1868).

The species of this genus were placed by Doubleday in a subsection of his first division of the comprehensive genus *Hetæra*; and they passed under that genus for many years, until Mr. Butler separated them in 1868. Its nearest allies are *Hetæra* and *Pierella*, with which it has in common a short internal nervure on the primaries which coalesces with the submedian, forming a sort of loop, somewhat as in *Ithomia* and its allies. As diagnostic characters *Callitæra* has the following:—The tibia of the front leg of the male is somewhat dilated, and the tarsus is nearly as long as the tibia; the lower discocellular of the secondaries meets the median nervure at the origin of its third branch; and the terminal joint of the palpi is short.

Callitæra is represented by at least three species in the basin of the Amazon. Another, perhaps two, are found in Guiana. *C. aurora* is found both in the Amazon valley and in Colombia, Ecuador, and Peru. Lastly, we have *C. menander*, almost peculiar to Central America south of Nicaragua, and *C. polita*, which probably occupies nearly the same area.

Mr. Kirby, in his 'Synonymic Catalogue,' uses the name *Cithærias*, Hübner, for this genus, a title we should have been glad to adopt did we feel that that course was open to us. *Cithærias*, as understood by Hübner, is a composite genus, first restricted by Doubleday and placed as a synonym of the typical division of *Hetæra*, which he made to contain two sections. Mr. Butler still further restricted *Cithærias* by associating it strictly with *Hetæra*, making a new name for Doubleday's other section. As this course was open to him, his assignment of these names must be accepted.

1. *Callitæra menander*. (Tab. VI. figg. 1, 2.)

Papilio menander, Drury, Ill. Exot. Ent. iii. t. xxviii. f. 3¹.

Callitæra menander, Butl. Cat. Sat. B. M. p. 101²; Butl. & Druce, P. Z. S. 1874, p. 337³.

Papilio andromeda, Fab. Ent. Syst. iii. p. 184⁴.

Hetæra andromeda, Bates, Ent. M. Mag. i. p. 180⁵; Butl. P. Z. S. 1866, p. 42, t. iii. f. 9⁶.

♂ alis hyalinis, venis divisis, anticarum marginibus striisque duabus transversis fuscis (una per cellulam, altera ultra eam) indistincte notatis, posticis ad angulum apicalem ocellis nigris flavo circumcinctis et albo pupillatis, dimidio distali rubro leviter tincto et linea irregulari fusca: subtus ut supra literam V formantibus.

♀ mari similis, sed striis fuscis posticarum distinctioribus et colore rubro minus distincto.

Hab. NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA³, Caché (*Rogers*); PANAMA, Chiriqui, Veraguas, Calobre (*Arcé*), Lion Hill (*M'Leannan*⁵).—COLOMBIA.

Great difference of opinion has of late existed as to the rightful owner of the name *Papilio andromeda*, Fabricius, one which has been applied to three very different insects by different entomologists, all of whom have grounds for the views they hold. Fabricius, in first introducing this name, makes no mention of the red patch on the hind wings, but, on the other hand, refers to a "litura parva, cærulea" on those wings, pointing at once to one of the blue-winged species *C. philis* or one of the allied forms, or to *C. esmeralda*. Mr. Butler uses *C. andromeda* without hesitation, and places *C. philis* (Cram.) as a synonym. Mr. Kirby, probably laying more stress upon the introduction of the word "parva" into the diagnosis, fixes it with equal confidence to the insect usually known as *C. esmeralda* (Doubl.). Mr. Bates⁵, looking to the fact that Fabricius himself, in his subsequent reference to his *Papilio andromeda*⁴, distinctly refers the name *P. menander*, Drury, to the same insect, and amends his diagnosis by the addition of the words "posticis apice rubris" (the words "litura cærulea" still remaining in a note), without hesitation uses the name *andromeda*, as an older title than *menander*, for this butterfly. Under these conflicting circumstances we are driven to the conclusion that to attempt to fix the name *andromeda* with certainty is hopeless, owing to the insufficiency of the original description and the uncertainty of its author respecting it, and that therefore it ought to be set aside altogether. We use, then, the following names for these three insects, about which there can be no reasonable doubts, viz. *C. menander* (Drury) for the Central-American species now under consideration, *C. philis* (Cram.) for the Guiana species, and *C. esmeralda* for that found at Para and its vicinity.

Although Drury says he received the specimen from which his figure is taken from Jamaica, it most probably came from the mainland, as this insect is not found in the West Indies, and his figure agrees accurately with our Central-American examples. Its range extends from Nicaragua just into Colombia, whence we have two examples. Thence southward into Peru its place is taken by a closely-allied form named *C. aurora* by Felder; this, though varying considerably both in the tint and extent of the colouring of the secondaries in certain localities, invariably has the blush more vivid and the inner portion of the cross band wavy instead of straight, and also a second band near to, but not touching, the outer margin as in the northern species.

Our figures are taken from Panama specimens.

2. *Callitæra polita*.

Hætera polita, Hew. Trans. Ent. Soc. 1869, p. 34¹.

♀ alis latissimis vitreo-hyalinis, marginibus externis valde rotundatis, anticarum marginibus striisque transversis quatuor fuscis—una intra cellulam, altera per cellulam a costa ad marginem internum extensa, tertia in cellulæ finem, quarta arcuata ultra cellulam a costa ad angulum analem extensa; posticarum margine et striga bicurvata submarginali fuscis, ocello uno nigro fulvo circumcincto et albo pupillato in angulo apicali marginem attingente.

Hab. NICARAGUA, Chontales (*Belt*¹, *Janson*); PANAMA, Chiriqui (*Arcé*).

Of this singular species we only possess female specimens ; so that we are unable to examine all the points which would fully justify its being placed in this genus rather than in *Hetæra*, where it has usually stood. The neurulation of the secondaries, however, is that of *Callitæra* ; and the presence of one and not two ocelli on the same wings points in the same direction ; so that we have little hesitation in placing the species in this genus. Its peculiar rounded wings, and the absence of any of the bright colours of *Callitæra*, make it very distinct from any of its congeners.

The species is a rare one, and was originally one of Belt's discoveries in Nicaragua, whence we have specimens. As it is also found in the neighbourhood of Chiriqui, it may be looked for in Costa Rica, from which country, however, no specimens have yet reached us.

HETÆRA.

Haetera, Latreille, Mag. f. Insektenkunde, vi. p. 284 (1807).

Hætera, Div. A, Sect. I. Subsec. b, Westw. Gen. Diurn. Lep. ii. p. 365.

Restricting the use of this name to *H. piera* and its immediate allies, the genus contains four or five species which are distributed over nearly the whole of Tropical South America from Costa Rica to South Brazil, one species (*H. macleannania*) coming within our limits. Some of the diagnostic characters of the genus, as distinguished from *Callitæra* and *Pierella*, consist in the male having the tibia of the front legs slender and the tarsus only about half the length of the tibia. In both sexes the lower discocellular of the secondaries meets the median close to the common origin of the second and third median branches, and the proximal segment of the subcostal is about equal to the proximal segment of the median. The wings are diaphanous as in *Callitæra*.

In one respect *Hetæra* differs widely from both *Callitæra* and *Pierella* ; and that is, in the secondary sexual characters of the male. In the former the upper hook (the "tegumen" of Buchanan-White), besides the central spine (which itself appears split), has two short lateral projections as in many other Satyridæ. The lateral jaws (the "harpagones") have a prominent tooth on the upper edge. In both *Callitæra* and *Pierella* the tegumen has a simple central projection, and the harpagones have a smooth upper edge without any tooth, as in *Hetæra*.

1. *Hetæra macleannania*. (Tab. VI. figg. 3, 4.)

Hætera macleannania, Bates, Ent. Month. Mag. i. p. 180¹.

Hetæra diaphana, Butl. & Druce, P. Z. S. 1874, p. 337² (nec Lucas).

♂ alis anticis vitreo-hyalinis, venis et marginibus fuscis ; posticarum margine externo in medio valde producto et rubro tincto, striga irregulari submarginali, duos ocellos nigros flavo circumcinctos et albo punctulatos, in marginem includente, a margine costali ad marginem externum medium, deinde ad marginem internum extensa fusca : subtus ut supra.

♀ mari similis, sed posticis ultra strigam colore coccineo (nisi apud ocellum superiorem) bene lavatis.

BIOL. CENT.-AMER., Rhopal., Vol. 1, Feb. 1880.

K

Hab. COSTA RICA (*Van Patten*²); PANAMA, Santa Fé (*Arcé*), Lion-Hill station (*M^r Leannan*¹).

This species may readily be distinguished from the Guiana *H. piera* by the absence in both sexes of the yellow clouding of the apical half of the secondaries—a character which prevails to a greater or less extent in all the local forms of *H. piera* except that found in South Brazil, which has received the name *H. hymenæa* from Dr. Felder, and which is almost certainly the same as *H. diaphana* of Lucas. The latter name was bestowed upon an insect supposed to have come from Cuba; but we have no more reason for believing that it did so than we have for crediting *H. nereis*, also included in Ramon de la Sagra's work, to the same island, neither having since been found there. In their paper on Costa-Rica butterflies² Messrs. Butler and Druce called the species of that country *H. diaphana*; but as Lucas lays stress upon the outer margin of the secondaries of his insect being less angular than in *H. piera*, and on the absence of red in the same region, we cannot admit this identification, and prefer to adhere to the name bestowed by Mr. Bates upon a female from Panama, with which Costa-Rican specimens of the same sex are identical.

Of the races of *H. piera* in South America, that found in Ecuador is perhaps the most nearly allied to *H. macleannania*, as in it we find the greatest development of red about the anal angle of the secondaries of the female. It has, however, the clear secondaries in common with the Brazilian *H. hymenæa*, and also the strongly marked submarginal band.

Our figures are taken from Panama specimens, that of the female from Mr. Bates's type.

PIERELLA.

Pierella, Westw. Gen. Diurn. Lep. p. 365 (1851), being Div. A, Sect. II. of *Hetera*.

Pierella, Butl. Cat. Sat. B. M. p. 103.

In this genus the wings are opaque, and the males are distinguished by a small spot of peculiar scales near the inner border of the secondaries. The tibia of the front legs of the male is slender and the tarsus as long as the tibia; in the secondaries the lower discocellular meets the median close to the origin of the first median branch; the proximal segment of the subcostal is much shorter than the proximal segment of the median. The genus thus restricted contains thirteen or fourteen species, which are distributed over the forest districts of Tropical South America from Mexico to South Brazil, being very common in the valley of the Upper Amazon, which is probably the metropolis of the genus. Four species come within our limits, whereof one is found in Mexico and Guatemala, and the other three between Nicaragua and the Isthmus of Panama.

1. *Pierella luna*.

Papilio luna, Fabr. Ent. Syst. iii. p. 109¹.

Hætera luna, Hew. Exot. Butt. (*Hæt.*) t. i. f. 3²; Butl. & Druce, P. Z. S. 1874, p. 337³.

Pierella luna, Butl. Cat. Sat. B. M. p. 104⁴.

Hætera pallida, Salv. & Godm. Ann. & Mag. Nat. Hist. ser. 4, ii. p. 142⁵.

Alis fuscis, anticis plaga certa luce viridosecente ornatis, linea communi a costa anticarum ad angulum analem posticarum transeunte obsenre fusca, aliis valde indistinctis interioribus; posticis obscurioribus præsertim in dimidio apicali, ocellis duobus nigris apud angulum apicalem, superiore majore et albo pupillato: subtus alis dilutioribus et fusco irroratis lineisque tribus communibus transversis obscuris notatis, posticis serie punctulis submarginalibus albis ornatis.

Hab. NICARAGUA² (*Bridges*⁵), Chontales (*Belt*); COSTA RICA (*Van Patten*³); PANAMA, Chiriqui, Veraguas, Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—COLOMBIA; GUIANA¹⁴.

The specimens described by Fabricius came from Surinam, and were formerly in Drury's possession. Demerara specimens, identified by Mr. Butler⁴ with this species, are in the British-Museum collection; but the only South-American examples we have are from Colombia. These are identical with the insect found in Central America as far north as Nicaragua. At one time we separated the Nicaraguan butterfly under the name of *Hetera pallida*⁵, as all the specimens we had then received from that country were very pale-coloured and resembled Hewitson's figure², which, it must be admitted, represents a much paler insect than usual. The receipt of more specimens from that country, in no way differing from the Panama and Colombian form, has led us to the conclusion that *P. pallida* can hardly be considered the distinct race we once supposed it to be; and we therefore now reunite it with *P. luna*.

The nearest ally of *P. luna* in South America is perhaps *P. rhea*, of which *P. lamia* is a local race. This species differs from it in having, in addition to the ocelli of the apical angle of the secondaries, a submarginal row of similar ocelli round the outer margin of those wings. *P. hyceta* and *P. latona* also belong to the same group, as well as *P. astyoche*.

We have described a male Nicaraguan specimen of the typical form.

2. *Pierella rubecula*. (Tab. VI. figg. 10, 11.)

Pierella rubecula, Salv. & Godm. Ann. & Mag. N. Hist. ser. 4, ii. p. 142¹.

P. lunæ similis, sed posticarum dimidio apicali, præter marginem ipsum, rufo lavato.

Hab. MEXICO (*Sallé*), Oaxaca (*Deppe*, *Mus. Ber.*); GUATEMALA, Yzabal and Motagua valley (*F. D. G. & O. S.*), Polochic valley (*Hague*).

This race of *P. luna* differs from the southern form in having a large rufous patch on the exterior half of the secondaries; the two apical ocelli are large, and frequently both are pupillated. It appears to be the local race in Mexico and Guatemala of *P. luna*, and entirely supplants that species in those countries. In South America two other species, *P. hyceta* and *P. latona*, show a development of rufous colour on the

secondaries similar to what we find in *P. rubecula*; but both of these species have more ocelli on the secondaries, and, in fact, bear the same relationship to *P. rhea* that *P. rubecula* does to *P. luna*.

The specimens we caught were found in virgin forest, and were usually seen flying close to the ground over dead leaves and herbage. When at rest with the wings closed they were most difficult to see.

Our figure and description are taken from the type specimen captured by us in the Motagua valley.

3. *Pierella incanescens*. (Tab. VI. figg. 5, 6.)

Pierella incanescens, Godm. & Salv. P. Z. S. 1877, p. 61¹.

Pierella helvina, Butl. & Druce, P. Z. S. 1874, p. 337².

Alis fuscis leviter purpureo tinetis, anticis fasciis tribus transversis obscurioribus, una prope basin, secunda ramum medianum primum attingente, et tertia ad cellulæ finem, fascia cinerea obliqua ultra cellulam a costa ad angulum analem ducta utrinque obscuro marginata, ocello nigro griseo circumcincto ad apicem, et tribus punctis albis in linea eadem submarginalibus notatis; posticis dimidio apicali, præter marginem ipsum, sanguineo, ocello magno nigro apud angulum apicalem et serie submarginali punctorum alborum ornatis: subtus alis dilutioribus, fasciaque communi obliqua grisea, in posticis dilatata bene distincta, colore sanguineo multum dilutiore.

Hab. NICARAGUA, Chontales (*Belt & Janson*¹); COSTA RICA (*Van Patten*², *Endres*¹), Irazu (*Rogers*); PANAMA, Chiriqui (*Arcé*), Chepo (*Arcé*¹).

A very close ally of *P. helvina* of Hewitson from Colombia, from which it differs in having the inner band crossing the secondaries less oblique and further beyond the end of the cell. The ocelli at the apical angle are larger and more conspicuous, and the red colour more extended, approaching nearer to the outer margin. These differences are slight, but fairly constant so far as they go; still we should not be surprised to find, on the receipt of a larger series of the true *P. helvina*, that the distinctness of *P. incanescens* could not be maintained.

The ranges of this species and of *P. ocreata*, next described, are rather singular, the latter species occupying a small area cut out, as it were, of the territory of its neighbour, being only found on the line of the Panama railway, and as far as the district of Santiago de Veraguas in that direction. Forty miles south of Panama at Chepo *P. incanescens* occurs; and from the neighbourhood of Chiriqui, through Costa Rica to Nicaragua, this is the only form. Though the close relationship of *P. ocreata* to *P. incanescens* is obvious, the white spot on the secondaries of the former is so conspicuous and so constant that their recognition is easy.

We have figured and described a Nicaragua specimen.

4. *Pierella ocreata*. (Tab. VI. figg. 7, 8, 9.)

Pierella ocreata, Salv. & Godm. Ann. & Mag. N. II. ser. 4, ii. p. 143¹; Butl. Cat. Sat. B. M. p. 105².

P. incanescens similis, sed anticis ocello nigro ad apicem minutissimo (aliquando absente); posticis macula alba subquadrata a costa medio alæ tenuis extendente, secunda subrotunda minore infra eam in colore sanguineo posita: subtus fascia obliqua fero alba et posticarum macula infra ocellum majoro et rubro marginata.

Hab. PANAMA, Calobre (*Arcé*¹), Lion Hill (*M. Leannan*^{1 2}).

As already stated, this is a close ally of *P. incanescens* and *P. helvina*, differing mainly but obviously in having a large white spot on the secondaries. In this respect it resembles the Brazilian *P. nereis*, a point of some significance when the frequent relationship of Central-American and Brazilian species is considered.

P. ocreata enjoys a limited range in the State of Panama, bounded on both sides by that of *P. incanescens*; but the two forms, so far as we know at present, do not in any way intermingle.

Our figures and descriptions are taken from Panama specimens, some of the original types.

ANTIRRHÆA.

Hætera, Div. B. *Antirrhæa*, Westwood, Gen. Diurn. Lep. ii. p. 365 (1851). (Type *Papilio philoctetes*, Linn.)

Antirrhæa auctt., Butl. Cat. Sat. B. M. p. 107.

The name *Antirrhæa* was first introduced by Hübner, in the second volume of the 'Sammlung exotischer Schmetterlinge,' and applied to *A. archæa* alone. This species was afterwards placed by Westwood in a section of Division B of the genus *Hetæra*, the other section containing *Hetæra philoctetes*. Mr. Butler, noticing that these two sections really constituted two distinct genera, made a new name, *Anchiplebia*, for *A. archæa* and its allies, leaving *A. philoctetes* in *Antirrhæa*, when the opposite course should have been taken and the new name bestowed upon *A. philoctetes* and its allies. As, however, the name *Antirrhæa* has so long been associated with the insects Mr. Butler places under it, we hesitate to disturb matters; still we cannot help feeling that Hübner's original application of his name ought to be respected, accompanied as it is with an excellent figure.

With *Hetæra Antirrhæa* has little in common. The anterior wings of the male have the submedian nervure curiously arched; and on the inside of this nervure beneath is a row of long hairs which curl upwards and meet in a point, the posterior wings having a patch of peculiar scales to correspond. The secondary sexual male organs are singularly formed; the upper piece or tegumen has a long decurved spine, but no lateral projections; whilst the harpagones are prolonged into long upturned and slightly recurved rods which are strongly serrate on their inner edge. This arrangement is very different from what is found in *Hetæra* and its allies.

Seven or eight species are now known of this genus; of these, three come within our limits, one of which extends as far north as Guatemala. Of the South-American

species the valley of the Amazon, Guiana, Venezuela, and Colombia seem to be the headquarters, none being found in South Brazil.

1. ***Antirrhæa miltiades*.** (Tab. VII. figg. 1, 2.)

Papilio miltiades, Fabr. Ent. Syst. iii. p. 66¹.

Antirrhæa miltiades, Butl. Cat. Fabr. Diurn. Lep. p. 28².

Antirrhæa lindigii, Feld. Wien. ent. Mon. vi. p. 425³; Reise Nov. Lep. p. 459, t. 66. f. 1, 2⁴.

Antirrhæa casta, Bates, Ent. Month. Mag. i. p. 179⁵.

♂ alis fuscis, anticis macula indistincta costali ferruginea, punctis duobus subapicalibus albis; posticis obscurioribus macula irregulari albescente in area discali punctoque coloris ejusdem (aliquando absente) apud angulum analem: subtus alis brunnescentibus in area media et posticarum limbo externo magis obscurus, fascia communi albescente posticarum angulum analem versus dilatata et in parte latissima maculam rotundam nigram continente, macula altera minore in angulo anali posita, striga communi arcuata obscura per cellulas alarum, altera intra cellulam anticarum et a basi propiore; posticis punctis quatuor nigris ad basin positis, ciliis posticarum angulum analem versus albicantibus.

♀ mari similis, sed pallidior et supra alis anticis fascia obliqua albicante notatis, subtus paulo dilutioribus.

Hab. GUATEMALA, Northern Vera Paz (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Janson*); PANAMA, Veragua, Calobre (*Arcé*), Lion-Hill Station (*M^cLeannan*).—COLOMBIA.

Fabricius originally described this species from Drury's collection, referring at the same time to a figure in Jones's drawings, but gave no locality for it. Dr. Felder redescribed it under the name of *A. lindigii* from a female example he received from Bogota³; and Mr. Bates also gave it the name of *A. casta*, from a specimen procured by us in Guatemala⁴.

Mr. Butler, on examining Jones's drawings, recognized the identity of both Dr. Felder's and Mr. Bates's insects with the Fabrician one, and accordingly united them all under the name *Antirrhæa miltiades* in his Catalogue of the Butterflies described by Fabricius; and we have every reason to believe he was right in so doing².

The range of *A. miltiades* extends from Guatemala to Bogota—but not interruptedly; for Messrs. Butler and Druce do not include it in their list of the Butterflies of Costa Rica, nor have we ever seen specimens from that country. On the line of railway and the adjoining parts of the State of Panama it appears again. This gap in its range is filled by its near ally *A. tomasia*, and by the very distinct *A. pterocopa* described below. We saw but little of this species in Guatemala, where it is rare. The specimens we took were in virgin forest, flying close to the ground, over dead leaves, at an elevation of about 1200 feet above the sea.

Our figure is taken from a Guatemala specimen, the type of *Antirrhæa casta*, Bates.

2. ***Antirrhæa tomasia*.** (Tab. VII. fig. 3.)

Antirrhæa tomasia, Butl. Ann. & Mag. N. H. ser. 4, xv. p. 222¹.

A. miltiadi similis, sed posticarum macula irregularis in area discali albescens abest, subtus fascia communi submarginali latiore.

Hab. PANAMA, Chiriqui (*Zahn*), Bugaba (*Arcé*¹).

This form, which is very closely allied to *A. multiades*, differing from it chiefly in the absence of the discal white spot of the secondaries, appears to be restricted to Chiriqui and its vicinity, where it exists to the exclusion of the allied form.

3. *Antirrhæa pterocopa*. (Tab. VII. figg. 4, 5, 6.)

Antirrhæa pterocopa, Salv. & Godm. Ann. & Mag. N. H. ser. 4, ii. p. 143.

♂ alis anticis fuscis, punctis tribus minutis griseis in area ultra cellulam positis; posticis obscurioribus, macula fulva irregulari ad apicem, puncto minuto griseo infra eam, maculis tribus cyaneis serie alam transeunte: subtus alis griseis fusco irroratis, fascia communi obscura arcuata a costa anticarum ad angulum analem posticarum extendente alteraque subparallela interiore griseo-purpureo extus marginatis, serie irregulari punctorum submarginalium albescientium punctoque nigro basin posticarum versus notatis.

♀ mari similis, sed colore fusco dilutiore, anticarum fascia transversa ultra cellulam cyanea notata maculas albidas includente, plaga fulva posticarum multo majore et margine externe late fulvo notate, maculis posticarum cyaneis ad marginem internum absentibus.

Hab. COSTA RICA (*Endres*); PANAMA, Santa Fé and Calobre (*Arcé*).

The specimen from which our original description was taken is a male in bad condition, sent by our collector, Arcé, from Santa Fé; since then we have received others of both sexes from the same country and also from Costa Rica. In colour it most resembles *A. philopæmen*, from the Upper-Amazon region; but it differs very considerably in the form of its anterior wings. These at their apex are abruptly obtuse instead of rounded, and the outer margin strongly angulated at the extremity of the upper radial. The great difference, too, in the size and coloration of the sexes is remarkable, no such contrast being seen in *A. philopæmen*. It appears to be a scarce insect, as we have received but few examples of it, notwithstanding the large collections that have come to us from the country it inhabits.

TISIPHONE.

Tisiphone, Hübner, Samml. ex. Schmett. ii. t. 86. (Type *T. hercyna*, Hübn.)

Tisiphone, Westwood, Gen. Diurn. Lep. ii. p. 370; Butl. Cat. Sat. B. M. p. 71.

When first used by Hübner* this genus included three species, none of which belongs to *Tisiphone* as now understood. He afterwards added *T. hercyna*; and this has long stood as the only representative of the genus, to the exclusion of the other three. According to strict law the modern practice is incorrect; but in dealing with Hübnerian genera great inconvenience and confusion would arise by enforcing conformity, and no doubt *Tisiphone* had best be left to stand as the name of this genus.

One of the distinguishing characters between *Tisiphone* and *Euptychia* and *Taygetis*

* Verz. bek. Schm. p. 60.

is the comparative length of the femur and coxa in the front leg of the male. In *Tisiphone* the femur is considerably longer than the coxa, whilst in the other genera the reverse is the case. In *Tisiphone*, too, the tegumen bears a single central spine; in *Taygetis* and *Euptychia* there is also a lateral spine on either side.

The front scales on the palpi of *Tisiphone* are shorter and more thick-set than usual in Satyrinæ.

Two species have been described of this genus, one of which, *T. maculata*, has a wide range, extending from Mexico to Bolivia. The range of the other, *T. hercyna*, is hardly satisfactorily known; but it appears to be found in the same countries as *T. maculata*, though it is doubtless much rarer.

1. *Tisiphone maculata*.

Tisiphone maculata, Hopff. Stett. ent. Zeit. 1874, p. 360¹.

Tisiphone hercyna, Butl. & Druce, P. Z. S. 1874, p. 338² (nec Hübn.).

Alis fusco-brunneis, anticis parte apicali nigricante, macula subapicali maculisque septem (secunda et tertia conjunctis) linea curvata dispositis a margine costali ad angulum analem; posticis paulo dentatis et lineis duabus obscuris submarginalibus notatis: subtus anticarum basi pallidiore, apice variegato et oculo parvo notato; posticis purpureo tinctis et valde variegatis, lineis obscuris undulatis et serie ocellorum sex ornatis, quorum duo costæ proximi et unus in angulo anali medius, nigris albo pupillatis.

Hab. MEXICO (*Koppe, Friedrich, Mus. Berol.*¹; *Sallé*), Cordova (*Rümel*); GUATEMALA, Retalhuleu, Vera Paz (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Hoffmann*¹, *Van Patten*², *Rogers*); PANAMA, Calobre (*Arcé*).—COLOMBIA; VENEZUELA; BOLIVIA¹.

This is a wide-ranging species, of which we have many examples from all parts of Central America. These all belong to the insect described by Hopffer under this name as distinct from *T. hercyna*, which has the spots of the anterior wings larger, more confluent, and arranged in a more regular curve. In Guatemala it is not common; our specimens were taken in the low-lying country on both sides of the mountains, at an elevation of about 1000 feet above the sea.

2. *Tisiphone hercyna*.

Tisiphone hercyna, Hübn. Samml. ex. Schm. ii. t. 86¹; Westw. & Hew. Gen. Diurn. Lep. ii. p. 370, t. 63. f. 2².

Morpho anosia, Godt. Enc. Méth. ix. p. 452³.

T. maculatæ similis, sed maculis anticarum majoribus, iis costæ proximis omnino conjunctis et omnibus serie regulari positis.

Hab. MEXICO (*Mus. Brit.*²).—VENEZUELA?; BRAZIL?³.

This species seems to be distinct from the last; but being a much rarer insect, its

range is not so well known. We have a single specimen, said to be from Venezuela; but our sole authority for including it in this work rests upon the plate in the 'Genera of Diurnal Lepidoptera,' which was taken from a Mexican specimen, and which undoubtedly belongs to Hübner's insect.

ORESSINOMA.

Oressinoma, Westwood, Gen. Diurn. Lep. ii. p. 371 (1851).

This genus contains two species, hitherto only known from the Andes, from Bolivia to Colombia, and from Venezuela. It is not unlike *Euptychia* in general appearance, though differing in the character of its markings. In structure it has several slight points of divergence. In the front legs of the female the tarsal joints form a sort of club at the end of the limb; and these legs seem destitute of hairs. In the secondary wings the upper discocellular is very short, the upper radial and the middle discocellular uniting close to the subcostal nervure. The median and submedian nervures are swollen at the base in *Oressinoma*, whereas in *Euptychia* the costal and median nervures are thus enlarged; the eyes, too, are smooth instead of hairy as is usual in *Euptychia*.

1. *Oressinoma typhla*.

Oressinoma typhla, Westw. Gen. Diurn. Lep. t. 62. f. 5.

Alis griseo-fuscis, marginibus obscurioribus, fascia communi lata alba a costa anticarum ad angulum posticarum analem extendente, linea submarginali pallida in anticis fere obsoleta, in posticis undulata: subtus ut supra, sed alis linea submarginali fulva et altera angusta alba interiore notatis; alis ad basin griseo irroratis.

Hab. COSTA RICA, Irazu (*Rogers*).—COLOMBIA, VENEZUELA, ECUADOR.

We have only seen from Central America the single female specimen of this delicate insect which we here describe; and this was sent us by Mr. Rogers, who captured it on the volcano of Irazu, in Costa Rica; we presume, therefore, it is scarce in this region. It appears to be tolerably common in Colombia, Venezuela, Ecuador, and Peru, whence we have many specimens. In Bolivia a very closely allied race is found having the white band crossing both wings narrower; the outer margins too are darker. To this form we gave the name *O. sorata*.

EUPTYCHIA.

Euptychia, Hübner, Verz. bek. Schm. p. 53 (1816); Westw. Gen. Diurn. Lep. ii. p. 372.

Mr. Butler, who has long paid attention to the species of this genus, in his latest revision enumerates 192 species as belonging to it. Though the distinctions he draws between many of these are very slight and hardly of specific value, there still remain several undescribed species, which will probably raise the total to about 200 species as comprised within the genus. These are for the most part distributed throughout Tropical America, some half-dozen species only occurring in the extratropical region of

BIOL. CENT.-AMER., Rhopal., Vol. 1, August 1880.

North America. In our limits no less than thirty-four species occur, of which twelve or thirteen are peculiar to the country, three pass northwards into the United States, and the remainder southwards into South America.

The limits of the genus *Euptychia* are by no means easy to define; for though its members are for the most part small insects, the gradation by size into the genus *Taygetis* is quite imperceptible. Then, again, the hairiness of the eyes, a character upon which considerable stress has been laid, is not one that is quite trustworthy, many of the larger *Taygetes* having eyes quite as hairy as most *Euptychiæ*. The palpi, too, seem to fail to give any definite distinction between the two genera. In *E. squamistriga*, the type of the genus *Pindis* of R. Felder, the palpi are so hairy that the terminal joint is hidden; whilst in most of the other members of the genus the terminal joint is plainly visible, long and slender, and directed forwards and upwards from the head; but between these extremes many intermediates occur.

The neuration of the primaries, too, is very variable; and we have not been able to satisfy ourselves that by trusting too much to these differences the species can be sorted into natural groups. In *E. eurytus*, of North America, the first subcostal branch is thrown off after the cell in the primaries, a character we have not yet found in any southern species. In a good many species the first branch is thrown off before the end of the cell, and the second after it. In others the second branch is emitted close to the end of the cell; and in others both first and second are emitted before the end of the cell.

The length of the upper discocellular is also variable: in by far the majority of species it is quite short; but in *E. camerta* and its immediate allies it is long; and in *E. hedemanni* it is altogether absent. The former of these has been placed in a genus *Neonympha*, and the latter as *Cyllopsis*.

We are hardly prepared to split the genus on such slight and variable characters, though this may be necessary at some future day. But to do so a close examination of the majority of the species will be necessary, as well as comparison with the surrounding genera.

In the eight divisions we have used in grouping the various species of Central-American *Euptychiæ* we have found apparently slight characters of colour give tolerably satisfactory results in our endeavour to define them; but with these we have associated characters drawn from the neuration of the primaries, as well as a few other minor points.

Though these groups would include many South-American species, we are fully aware that by no means all these southern forms are represented in Central America; so that, were the whole genus under revision, considerable additions to and modifications of our arrangement would become necessary. To do this would carry us beyond the scope of this work; so we have confined our attention to the species occurring within the limits of our fauna.

- a. Internal area of upper surface of wings chalky white; apex of primaries of male slightly falcate; middle discocellular of primaries angular, and emitting a recurrent nervule; two subcostal branches emitted before the end of the cell.

1. *Euptychia ocirrhoe*.

Papilio ocirrhoe, Fabr. Gen. Ins. p. 260¹; Ent. Syst. iii. p. 96²; Bates, P. Z. S. 1863, p. 249³.

Euptychia ocirrhoe, Butl. P. Z. S. 1866, p. 459⁴; Cat. Fabr. Diurn. Lep. p. 11⁵; Butl. & Druce, P. Z. S. 1874, p. 335⁶.

♂ alis cretaceo-albis, lineis paginæ inferioris vix apparentibus; anticarum costa et apice fuscis; posticis linea duplici submarginali fusca notatis: subtus alis fuscis, fasciis duabus albis et altera ad basin notatis, lineis duabus submarginalibus (interna valde sinuata); ocellis tribus in area anticarum apicali, et quinque posticarum submarginalibus (secundo et quinto maximis et albo pupillatis).

♀ mari similis, sed anticis haud falcatis et posticis plerumque late fusco marginatis.

Hab. MEXICO, Cordova (*Rümeli*), Oaxaca (*Deppe*, *Mus. Berol.*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Yzabal and Retalhuleu (*F. D. G. & O. S.*), Zapote (*Champion*); NICARAGUA, Chontales (*Belt*, *Janson*); COSTA RICA (*Van Patten*⁶); PANAMA, Chiriqui and Calobre (*Arcé*), Lion Hill (*M^cLeannan*³).—SOUTH AMERICA to Brazil.

This is a lowland species of very wide range, being found everywhere in forests from Southern Mexico and Guatemala to South-eastern Brazil, spreading over the valley of the Amazons, Venezuela, and Guiana (the origin of the Fabrician type¹⁵). The species seems subject to slight variation; but we have not been able to detect any constant difference between specimens from the most distant localities. The variety from the Polochic valley indicated by Mr. Butler⁴ as 1a, appears to belong to the next species. The specimens we took at Yzabal (one of which we have described) were flying in the low brushwood of the forest near the town.

2. *Euptychia metaleuca*. (Tab. VIII. figg. 1, 2.)

Neonympha metaleuca, Boisd. Léop. Guat. p. 63¹.

Euptychia ocirrhoe, var. a, Butl. P. Z. S. 1866, p. 459².

Euptychia butleri, Dist. Pr. Ent. Soc. 1876, p. xii³; Butl. Journ. Linn. Soc. Zool. xiii. p. 116⁴.

E. ocirrhoe affinis, subtus fascia alarum communi alba unica nec duplici distinguenda.

Hab. MEXICO, Cordova (*Rümeli*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA¹, Chisoy and Polochic valleys, Chiacam, Cahabon (*Hague*), Pancina (*Champion*), Yzabal, forests of Northern Vera Paz (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Janson*); COSTA RICA (*Gabb*³), Cache (*Rogers*).—ECUADOR.

This butterfly was for some time confused with its near ally *E. ocirrhoe*, of which Mr. Butler considered it a variety². It was described by Dr. Boisdual in 1870¹, and a few years afterwards by Mr. Distant³, whose names were placed together by Mr. Butler in his last revision of the genus *Euptychia*⁴.

The species has now been traced over a wide area, being found in low-lying lands almost uninterruptedly from Southern Mexico to Ecuador. We have, however, not yet received specimens from any part of the State of Panama; nor have we seen it from other districts of Colombia.

It frequents the same forests as *E. ocirrhoe*, flying amongst the low herbage of the undergrowth.

We have figured a Guatemalan specimen from the Polochic valley.

- b.* Wings either chalky white on the inner area of the wings or brown, the transverse lines and spots of the underside showing distinctly above; middle discocellular of primaries angular, emitting a strong recurrent nervule at the angle; two subcostal branches emitted before the end of the cell.

3. ***Euptychia mollina*.** (*E. westwoodi*, Tab. VIII. figg. 13, 14.)

Euptychia mollina, Hübn. Zutr. i. p. 20, f. 105, 106¹.

Euptychia westwoodi, Butl. P. Z. S. 1866, p. 481², 1867, t. 12. f. 3³; Butl. & Druce, P. Z. S. 1874, p. 336⁴.

Euptychia mollis, Staud. Verh. z.-b. Gesellsch. Wien, 1875, p. 105⁵.

Alis albescentibus, fasciis duabus transversis fuscis, anticarum costa et area apicali (ocellum includente) eodem colore tinctis; posticis linea submarginali obscura ocellisque duobus ornatis, uno ad apicem, altero ad angulum analem positis: subtus alis albidis, fasciis sicut supra rubido-fuscis, altera ad basin (in anticis obliqua) notatis; posticis ocellis sex submarginalibus ornatis, secundo et quinto maximis.

Hab. MEXICO, Oaxaca (*Deppe*, *Mus. Berol.*); GUATEMALA, Pancina, Polochic valley, Cubilguitz, Cahabon (*Champion*), HONDURAS (*Mus. Brit.*²); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*⁴); PANAMA, Chiriqui (*Ribbe*⁵), Lion Hill (*M^cLeannan*). — VENEZUELA; GUIANA; AMAZONS.

We have now seen a large number of specimens of this species from various parts of its range, which extends from the valley of the Amazons through Guiana, Venezuela, and Central America as far north as Southern Mexico. Though specimens vary considerably from different places, we are unable to group any races in a definite manner, the extremes being connected by intermediate forms so completely. It has been proposed to divide the species into three, the name for the oldest of which is Hübner's *E. mollina*, the type of which probably came from Northern Brazil. A Honduras example was the type of Mr. Butler's *E. westwoodi*; and the Chiriqui insect was described by Dr. Staudinger as *E. mollis*.

We have seen typical specimens of both of the latter, and have compared them with Amazons and Guiana examples. The Central-American butterfly has the cross bands of the wings usually rather wider and more rufous in colour; and this difference is especially obvious in Nicaraguan insects; but others are undistinguishable from Amazonian specimens, so that a race has not yet been completely formed. *E. mollis* and *E. westwoodi* seem to us to be almost absolutely alike.

4. *Euptychia fetna*. (Tab. VIII. figg. 15, 16.)

Euptychia fetna, Butl. Ent. M. Mag. vi. p. 250¹.

Alis valde rotundatis, fuscis; anticis fasciis duabus transversis et plaga ad angulum analem ferrugineis notatis, ocello unico ad angulum apicalem; posticis fascia mediana transversa et altera submarginali ferrugineis ornatis, lineisque submarginalibus forma catenæ positæ, ocello ad angulum analem: subtus ut supra sed pallidior et magis distincte notata, posticis serio quinque ocellis ornatis (secundo et quarto maximis, reliquis fere obsoletis).

♀ paulo major, ocellis valde majoribus et maculis alarum paginæ superioris multo magis distinctis.

Hab. GUATEMALA, San Gerónimo (*Hague*¹, *Champion*), Cubilguitz (*Champion*).

Of this pretty species the single specimen sent to us by Mr. Hague, the type of Mr. Butler's description, was long the only one we possessed. Lately, however, we have had the pleasure of receiving several others from Mr. Champion, who obtained them, also at San Gerónimo, in August 1879 and again in the present year.

Though very distinct, the species clearly belongs to the group of *Euptychia* which contains *E. mollina*.

We have figured and described the type.

5. *Euptychia anaclea*.

Euptychia anaclea, Butl. Journ. Linn. Soc. Zool. xiii. p. 123¹.

Alis pallidissime fuscis, lineis mediis duabus transversis et marginibus externis obscurioribus, anticis ocello ad apicem, posticis quinque serie submarginali, ultimo maximo: subtus ut supra, sed alis dilutioribus et anticis plaga mediana flavescenti-rufo suffusa et angulum analem versus extendente, ocello nigro, flavo circumcincto, ad apicem, duabus infra fere obsoletis; posticis ocellis quinque submarginalibus, ultimo maximo, lineaque valde undulata ad margines externos.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Chiriqui (*Ribbe*¹).—COLOMBIA¹.

A curiously pale-coloured species, also distinguished by its nearly straight row of ocelli on the underside of the secondaries, as well as by the patch of yellowish rufous on the primaries beneath. It has no near allies, but seems best placed in the same group as *E. mollina*, though Mr. Butler thinks its affinities are with *E. myncea*. The second subcostal branch in the primaries is emitted nearer the end of the cell than in *E. mollina*.

A single specimen was contained in Belt's collection, the only one we have seen except the types when they were in Mr. Butler's hands for description. The latter belong to Dr. Staudinger, and came from Chiriqui and Colombia.

6. *Euptychia insolata*.

Euptychia insolata, Butl. & Druce, Cist. Ent. i. p. 99¹; P. Z. S. 1874, p. 337²; Butl. Journ. Linn. Soc. Zool. xiii. p. 117³.

Euptychia macrophthalma, Staud. Verh. z.-b. Gesellsch. Wien, 1875, p. 106⁴.

Alis fuscis, lineis transversis et ocellis paginæ inferioris se permonstrantibus: subtus argenteo-griseis, margines versus obscuris, fasciis duabus mediis transversis ferrugineo-fuscis; anticis linea obliqua ejusdem coloris ad basin, oculo ad apicem, alteroque minore infra eum; posticis ocellis duobus magnis et duobus inter eos notatis.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*^{1 2}); PANAMA, Chiriqui (*Arcé, Ribbe*⁴).

This insect is probably most nearly allied to *E. picia* of Butler, which has a considerable range in the northern portion of the South-American continent. From it *E. insolata* differs in having the secondaries rather more produced, and in the marking of the upper surface, the ocelli being rather more clearly defined.

As regards Dr. Staudinger's *E. macrophthalma*, we have specimens so named from him. These we have compared with the type of *E. insolata*, and find them identical. Mr. Butler, in his latest revision of the genus *Euptychia*³, places *E. macrophthalma* next to his *E. binocula*, not recognizing its true position.

As in *E. anaclea*, the second subcostal branch of the primaries is emitted close to the end of the cell.

- c. Secondary wings with a large ocellus in a fulvous patch near the anal angle; primaries with a linear group of metallic spots surrounded by a dull brown oval line; middle and lower discocellulars in a continuous curve; two subcostal branches emitted before the end of the cell.

7. *Euptychia salvini*. (Tab. VIII. fig. 17.)

Euptychia salvini, Butl. P. Z. S. 1866, p. 498, t. 40. f. 13¹.

Alis supra pallide fuscis; anticis sex, posticis tribus lineis transversis fuscis notatis: subtus anticis ad apicem linea ovali maculas argenteo atomatas continente notatis; posticarum parte distali fulva, ocellis duobus ad angulum apicalem et altero magno ad angulum analem ornata.

Hab. PANAMA¹, Lion Hill (*M^cLeannan*).

Of this species the single ragged female specimen described by Mr. Butler is the only one we have yet met with. This was sent to us by the late James M^cLeannan from his station on the Panama railway.

It belongs to the group of *Euptychia* which contains *E. chlorimena* (Stoll), *E. itonis*, Hew., and their allies, species all more or less rare in South America, Guiana and the Amazons valley being their headquarters.

- d. Wings of male opaque brown, of female paler, the markings of the underside sometimes showing faintly above; upper discocellular of primaries very short, directed outwards, middle discocellular strongly convex.
- a'. First subcostal branch emitted before the end, the second at the end of the cell.

8. *Euptychia labe*. (Tab. VIII. fig. 3.)

Euptychia labe, Butl. Ent. Monthly Mag. vi. p. 250, t. 1. f. 2¹; Dist. Pr. Ent. Soc. 1876, p. xii².

Euptychia crantor, var., Doubl. & Hew. Gen. Diurn. Lep. p. 373³ (nec Cramer, fide Butler).

Euptychia myncea, Dist. Pr. Ent. Soc. 1876, p. xii (nec Cramer)⁴.

Euptychia myncea, var. *c*, Butl. P. Z. S. 1866, p. 461⁵.

Alis supra fuscis, lineis obsoletis submarginalibus notatis, anticarum area apicali ocello unico plerumque ornata, posticarum angulo anali quoque ocellato: subtus alis pallidioribus, lincis duabus subrectis rufescentibus a costa anticarum ad marginem posticarum internum ductis; plaga ochracea in area anticarum distali; anticis ocello apicali et aliis infra eum obsoletis ornatis; posticis serie ocellorum quinque (secundo et quinto maximis) notatis.

Hab. MEXICO, Cordova (*Rümeli*); GUATEMALA, Choctum and Polochic valley¹ (*Hague*), San Gerónimo, Zapote (*Champion*); HONDURAS (*Mus. Brit.*³); NICARAGUA, Chontales (*Janson*); COSTA RICA (*Van Patten*, *Gabb*^{2 4}); PANAMA, Santa Fé and Calobre (*Arcé*¹), Lion Hill (*M·Leannan*).—COLOMBIA, Valle Dupar (*Simons*).

This species is a near ally of *E. myncea* (Cr.) of Guiana, and may possibly be found inseparable from that insect. The chief differences consist in the greater development of the tawny patch near the margin of the anterior wings beneath, and in the transverse bands of the wings on the underside being narrower and redder. In some specimens the primary wings have an ocellus near the apex on the upper side; in others this is evanescent; and in others again it is entirely absent. In specimens from the State of Panama the ocellus of the secondary wings is large and conspicuous.

E. labe has a wide range in Central America, being found in the low-lying lands from Southern Mexico to Panama.

We have figured and described one of the types from Calobre, Panama.

9. *Euptychia terrestris*.

Euptychia terrestris, Butler, P. Z. S. 1866, p. 462, t. 39. f. 1¹.

E. laba similis, sed minor, plaga ochracea anticarum paginæ inferioris absente, et striolis metallicis inter posticarum ocellos duos elongatis nec rotundatis distinguenda.

Hab. NICARAGUA, Chontales (*Belt*).—AMAZONS, Para¹, &c.

A single, rather faded specimen from Belt's collection agrees fairly with Mr. Butler's type of *E. terrestris*, a species originally described from a Para example, but which we now trace throughout the Amazons valley.

10. *Euptychia pieria*.

Euptychia pieria, Butl. P. Z. S. 1866, p. 463, t. 39. f. 3¹; Butl. & Druce, P. Z. S. 1874, p. 336².

Euptychia usitata, var. *b*, Butl. P. Z. S. 1866, p. 463³.

Euptychia usitata, Butl. & Druce, P. Z. S. 1874, p. 336⁴; Butl. Ent. Monthly Mag. vi. p. 252⁵.

Alis brunneis, fascia communi fusca transversa, altera per cellulam anticarum et duabus submarginalibus notatis, ocello (bipupillato) ad anticarum apicem, altera ad angulum posticarum analem: subtus alis fulvescentioribus, fascia communi pallida extra cellulam ornatis, ocellis (uno magno, altero parvo) bipupillatis ad angulum posticarum apicalem, margine externo lineis duabus submarginalibus fuscis notato.
Obs. *E. labæ* affinis, plaga fulva anticarum paginae inferioris absente.

Hab. MEXICO (*Deppé*, *Mus. Berol.*), Cordova (*Rümeli*); GUATEMALA, Polochic valley³, Choctum and Yzabal (*F. D. G. & O. S.*), Pancina, Polochic valley (*Champion*); HONDURAS (*Mus. Brit.*¹), San Pedro (*G. M. Whitely*); NICARAGUA, Chontales (*Janson*); COSTA RICA (*Van Patten*^{2 4}); PANAMA, Chiriqui (*Ribbé*), Lion Hill (*M^cLeannan*).—VENEZUELA?

This species has a wide range in Central America; and if the Venezuela form is the same, as Mr. Butler thinks it in all probability is⁵, it spreads into the north-western parts of South America. As the name *E. pieria* was originally applied to a Central-American insect, we retain that name for the present species, leaving the question of its identity with the Venezuelan form for further consideration, as we have not yet had sufficient materials before us to enable us to form a decided opinion on the subject.

E. pieria is a lowland species, being probably restricted to districts lying below an elevation of 2500 feet.

We have described a specimen from Honduras, where the type of *E. pieria* was taken¹.

11. *Euptychia gulnare*. (Tab. VIII. fig. 11.)

Euptychia gulnare, Butl. Ent. Monthl. Mag. vi. p. 250, t. i. f. 3¹.

Alis supra fusco-brunneis unicoloribus: subtus alis pallidioribus, linea fusco-nigra submarginali valde sinuata aliisque duabus (una ultra, altera per cellulam transeuntibus); alis anticis ocello unico ad angulum apicalem notatis; posticis ocellis quinque submarginalibus, secundo et quinto maximis et albo distincte pupillatis, reliquis parvis et indistinctis.

Hab. PANAMA, Lion Hill (*M^cLeannan*).

Of this dull-coloured species only a single male specimen has as yet reached us; this Mr. Butler described in 1870¹, and compared it with *E. harmonia*. The neuration of the primaries, however, places it with *E. labe* and its allies, whilst *E. harmonia* goes with *E. camerta* in a distinct group.

12. *Euptychia squamistriga*. (*E. zabdi*, Tab. VIII. fig. 24.)

Pindis squamistriga, R. Feld. Verh. k. k. zool.-bot. Ges. Wien, 1869, p. 475¹; Butl. Lep. Ex. "Corrections"².

Euptychia zabdi, Butl. Lep. Ex. p. 11, t. 4. f. 7³.

Alis supra fuscis, anticis truncatis, posticis in margine externo angulum analem versus distincte dentatis: subtus alis nigricanti obsolete irroratis, linea submarginali valde indistincta sinuata et altera communi, in posticis angulata, transversa fusco-nigricantibus, alis ultra hanc pallidioribus; posticis punctis quinque nigris ornatis (secundo maximo, quinto albo pupillato).

Hab. MEXICO, Huahuapam (*Hedemann*¹), Cuernavaca (*Mus. Felder*¹); GUATEMALA, Choctum (*Hague*³).

The eyes in this species are destitute of hairs, and the palpi more densely hairy than in almost any other *Euptychia* that we have examined. These and other less important characters induced R. Felder to place *E. squamistriga* in a genus by itself; and we should be glad to adopt this division, were we able to trace any well-defined group of insects possessing such characteristics. But the hairiness or smoothness of the eyes, so far as we have been able to see, is subject to considerable variation in *Euptychia*, and still more so the hairiness of the palpi; so that we have not been able to make any satisfactory divisions resting upon these features. The neururation of the primaries places *E. squamistriga* with the insects which here precede it, where it may rest pending a thorough examination of the whole genus.

This species is apparently a rare one, as we have received but a single specimen from Guatemala, the type of *E. zabdi*, now figured. In Mexico, besides the type obtained by Lieut. v. Hedemann at Huahuapam, near Cordova, Felder speaks of two other males in his collection captured at Cuernavaca.

The names given by R. Felder and Mr. Butler to this butterfly were proposed within a few weeks of each other. The paper containing the description of the former author was read, but probably not published, prior to the issue of the part of 'Lepidoptera Exotica' containing the description and figure of the latter. As Mr. Butler in his corrections places his name, *E. zabdi*, as a synonym of *E. squamistriga*, we follow him in so doing.

U. First subcostal branch of primaries emitted before the end of the cell, the second beyond it.

13. *Euptychia similis*. (Tab. VIII. fig. 4.)

Euptychia similis, Butl. P. Z. S. 1866, p. 463¹.

? *Euptychia similis*, var., Butl. P. Z. S. 1866, p. 463², 1867, t. 12. f. 10³.

? *Euptychia undina*, Butl. Ent. Month. Mag. vi. p. 252⁴.

E. labce affinis, sed alis anticis subtus haud fulvo notatis et serie ocellorum submarginali obsoleta, ocello ad angulum analem tantum bene definito; striis transversis multo angustioribus.

Hab. MEXICO, Oaxaca (*Rébouch*); GUATEMALA, San Gerónimo (*Champion*), central valleys (*F. D. G. & O. S.*¹ & *H. Hague*); ? NICARAGUA (*Mus. Brit.*^{2 3 4}).

Though closely resembling *E. pieria*, this butterfly appears to be sufficiently distinct from that species to be recognizable. Besides the slight difference in the position of the second subcostal branch of the primaries, the chief differences observable are the position of the ocellus of the anal angle of the hind wings beneath (which in *E. similis*

is placed further from the margin), and in the principal band of the wings beneath being straighter. In Guatemalan specimens the anal ocellus is the only one that is enlarged, but in the example from Nicaragua in the British Museum, which Mr. Butler first described as a variety of *E. similis*^{2 3}, and afterwards as a distinct species⁴, the second spot from the costa is also enlarged. We do not feel confident that the Nicaraguan insect is really distinct, a larger series being requisite to establish its validity.

E. similis has a rather restricted range in Guatemala, being found in the central districts at an elevation of about 3000 feet above the sea.

We have figured the type specimen.

14. *Euptychia renata*. (Tab. VIII. fig. 5.)

Papilio renata, Cramer, Pap. Ex. iv. t. 326. f. A¹.

Euptychia renata, Butl. & Druce, P. Z. S. 1874, p. 336².

Euptychia disaffecta, Butl. & Druce, P. Z. S. 1874, p. 336³.

Alis fuscis, linea submarginali duplici notatis, area posticarum anali ocellata: subtus alis griseo-fuscis, fusco irroratis et lineis duabus transfasciatis; posticis ocellis tribus (aliquando omnino absentibus), uno ad angulum apicalem, duobus ad angulum analem, ornatis.

Hab. GUATEMALA, Polochic and Chisoy valleys (*Hague*), Chiacam and Pancina, Polochic valley (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*v. Patten*^{2 3}), Caché (*Rogers*); PANAMA, Calobre (*Arcé*), Lion Hill (*McLeannan*).—COLOMBIA; VENEZUELA; GUIANA; AMAZONS VALLEY.

There seems to be no certain local variation in specimens from the wide area indicated above. The ocelli of the under surface of the secondaries are perhaps rather smaller, as a rule, in Central-American examples; but the difference is not material. The specimen described by Messrs. Butler and Druce from Costa Rica as *E. disaffecta*³ proves to be an example of *E. renata* with rather small ocelli; but we have a specimen from that country where the ocelli are obsolete, and this was selected from others of more normal type.

One of the chief characteristics of this species is the mottled appearance of the under surface of the wings. This is well rendered in Cramer's figure; so that the applicability of his name is hardly doubtful.

We have figured a female specimen from the Chisoy valley.

15. *Euptychia rubricata*.

Euptychia rubricata, W. H. Edw. Trans. Am. Ent. Soc. iii. p. 212¹.

Alis valde rotundatis, supra brunneis, lineolis tribus submarginalibus notatis, plaga magna læte ferruginea ornatis, ocellis duobus argenteo bipupillatis, uno ad angulum anticarum apicalem, altero ad angulum posticarum analem: subtus alis griseo-brunneis, area media anticarum læte ferruginea, lineolis marginalibus et ocellis sicut in pagina superiore; anticis stria rubida a costa ad angulum analem ultra cellulam trans-eunte, duabus maculis duplicibus cæruleo-argenteis infra ocellum apicalem notatis; posticis stria fusca a costa

ad marginem internum (extus pallide grisco limbata) et ocellis quinque serie submarginali positis ornatis, primo maximo, reliquis obsoletis sed argenteo indicatis.

Hab. NORTH AMERICA, Texas¹.—MEXICO (*Deppe, Mus. Berol.*); GUATEMALA, Cachil, Vera Paz (*Champion*).

Mr. Champion has recently sent us several specimens of this pretty species, all taken 3000 or 4000 feet above the sea, on the steep hill-side near the village of Cachil, and overlooking the plain of Salamá in Vera Paz. These agree very fairly with Mr. W. H. Edwards's description of his *E. rubricata*, described from Texan specimens. In Guatemala the insect is doubtless very local in its distribution. Mr. Champion only obtained it in one place; and we never met with it ourselves, nor have we received it from any other collector. Two years ago we examined five specimens of a *Euptychia* in the Berlin Museum, two of which were of Deppe's collecting, the others from Texas. From our notes we have little doubt they all belong to *E. rubricata*.

c'. First and second subcostal branches of primaries emitted before the end of the cell.

16. *Euptychia oreba*.

Euptychia oreba, Butl. Cist. Ent. i. p. 19¹; Ent. Monthly Mag. vi. p. 252, t. 1. f. 7²; Dist. Pr. Ent. Soc. 1876, p. xiii³.

Alis supra ferrugineo-fuscis; posticis rotundatis, extus paulo sinuatis: subtus alis cinerascientioribus; linea submarginali nigricante, altera valde sinuata, tertia fere recta ultra cellulam, et quarta indistincta per cellulam notatis; anticis ocellis quinque albo pupillatis sed indistinctis serie submarginali positis; posticis quoque ocellis quinque notatis, secundo et tertio obsoletis.

Hab. COSTA RICA (*Gabb*³).—COLOMBIA.

This species was originally described from specimens of which the locality was not recorded¹. These are now before us, and agree fairly with the specimen referred by Mr. Distant to *E. oreba* in his supplementary enumeration of Costa-Rican butterflies³. We have also specimens from the neighbourhood of Santa Marta, Colombia, which we consider to belong to the same species. Between these specimens, five in number, a certain amount of variation exists, but not enough to justify their separation without more materials. The Costa-Rica example comes nearest to the type.

17. *Euptychia libye*.

Papilio libye, Linn. Syst. Nat. ii. p. 772¹.

Euptychia libye, Butl. P. Z. S. 1866, p. 486²; Butl. & Druce, P. Z. S. 1874, p. 336³.

Euptychia libyoidea, Butl. P. Z. S. 1866, p. 487⁴, 1867, pl. 11. f. 13⁵; Dist. Pr. Ent. Soc. 1876, p. xiii⁶.

Alis supra fuscis, marginibus externis lineis duabus angustis circumciuctis: subtus alis multo pallidioribus; posticis purpureo tinctis, fasciis duabus ferrugineis, una per cellulam, altera ultra eam transfasciatis, lineis duabus submarginalibus et plaga elongata intra eas notatis; anticis oculo parvo in apice notatis; posticis ocellis quinque ornatis, primo et quarto multo majoribus et bipupillatis, quinto parvo, reliquis obsoletis.

Hab. GUATEMALA, Polochic valley (*F. D. G. & O. S.*²), Chisoy valley (*Hague*), Choctum (*Hague*), Retalhuleu (*F. D. G. & O. S.*), Cubilguitz, Chiacam, Cahabon and Zapote (*Champion*); NICARAGUA⁴, Chontales (*Belt, Janson*); COSTA RICA (*v. Patten*³, *Gabb*⁶); PANAMA, Chiriqui, Calobre, and Santa Fé (*Arcé*).—SOUTH AMERICA to North Brazil; JAMAICA.

This is one of the commonest species of *Euptychia* in Central America; and we have received numbers of specimens from Guatemala. It varies to some extent in the markings of the underside; but we fail, at present, to see any definite geographical races, though Mr. Butler has separated an insect of this form from Nicaragua as a distinct species. In Guatemala, as doubtless elsewhere, *E. libye* is an inhabitant of the low-lying hot country.

18. *Euptychia tiessa*.

Euptychia tiessa, Hew. Equat. Lep. p. 37¹; Butl. Lep. Exot. p. 48, t. 18. f. 4².

Alis supra rufo-fuscis, linea obscura submarginali notatis; posticis dentatis et ocello nigro rubro circumdato ornatis: subtus ut supra, alis lineis duabus transversis mediis ferrugineis, linea duplici submarginali ejusdem coloris, inter has fascia lata grisea centro ferrugineo notatis; anticis ad apicem uno, posticis quinque ocellis submarginalibus ornatis, primo (maximo), quarto et quinto pupillatis, reliquis obsoletis.

Hab. NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*v. Patten*), Irazu (*Rogers*); PANAMA, Calobre (*Arcé*).—ECUADOR.

This species may readily be distinguished from all its allies by the rich ferruginous markings of the underside, and by the broad submarginal grey band with a central ferruginous streak, in which the ocelli are placed. We have several examples taken by Mr. Belt at Chontales, in Nicaragua—southward of which locality it would appear to be rather a scarce insect, as we have only two specimens from Costa Rica and one from Panama. These, however, all agree with one we have from Guadalquiza, in Ecuador, where the types were obtained¹.

19. *Euptychia satyrina*. (Tab. VIII. fig. 23.)

Tagetis satyrina, Bates, Ent. Monthl. Mag. i. p. 179¹; Butl. & Druce, P. Z. S. 1874, p. 335².

Euptychia gigas, Butl. P. Z. S. 1866, p. 486, t. 40. f. 7³; Dist. Pr. Ent. Soc. 1876, p. xiii⁴.

Taygetis incerta, Butl. & Druce, Cist. Ent. i. p. 98⁵; Butl. Lep. Exot. p. 149, t. 53. f. 1⁶.

Alis fuscis (siquando ferrugineo notatis); posticis ocello nigro albo pupillato, plerumque ferrugineo circumcincto (aliquando fere obsoleto), angulum analem versus: subtus dilutior, alis linea submarginali valde undulata, ferruginea, altera curvata interiore, tertia basin propiore; anticis punctis nigris indistinctis apud apicem; posticis ocellis quinque notatis, primo, quarto et quinto maximis.

Hab. MEXICO (*Mus. Brit.*); GUATEMALA, Polochic valley (*F. G. & O. S.*¹), Chuacus, Plain of Salamá, Choctum, Chisoy valley (*Hague*); Coban, Pancina, and San Gerónimo (*Champion*); COSTA RICA (*v. Patten*^{2,3,5}, *Gabb*⁴), Irazu (*Rogers*); PANAMA, Chiriqui (*Arcé*).

This species was originally described by Mr. Bates from a specimen obtained by us in the Polochic valley, Guatemala¹. It is a common insect in the shady forests, and exhibits a considerable amount of variation, which has led to its having been redescribed by Mr. Butler. We have a good series of specimens picked from a large number of individuals. These show a gradual variation from the type specimen, which is dark brown on the upper side, faintly ocellated between the first and second median branches of secondaries, beneath rusty brown, both wings crossed near the middle by parallel ferruginous lines edged with ochreous, the outer line on the inner side, the inner line on the outer side; both wings are paler towards the outer margin. Some of our specimens from Costa Rica have the whole of the interior area of the primaries and a portion of the secondaries on the upper side ferruginous; these are much paler beneath, being of a rich ochreous brown, especially on the anterior wings; they also have two small white spots near the apical ocellus of the anterior wings, the second and third ocelli of the secondaries being also white. Between these two extremes there is every grade of variety, rendering it quite impossible to recognize more than one species. *Taygetis incerta*⁵, of which we have the type, we consider nothing more than a pale variety of the present species. The markings are precisely in the same places in each; and we have likewise intermediate examples leading up to this form.

20. **Euptychia polyphemus.** (*E. cyclops*, Tab. VIII. fig. 22.)

Euptychia polyphemus, Butl. P. Z. S. 1866, p. 488¹.

Euptychia umbracea, Butl. & Druce, Cist. Ent. i. p. 98²; Butl. Lep. Exot. p. 149, t. 53. f. 2³.

Euptychia cyclops, Butl. Journ. Linn. Soc. Zool. xiii. p. 126, t. 12. f. 2⁴.

Alis fuscis: subtus ut supra, linea submarginali sinuata obscura duabusque mediis subparallelis; anticis punctis minutis albis ad apicem, posticis alis quatuor submarginalibus ocelloque nigro albo pupillato, inter ramos medianos secundum et tertium notatis.

Hab. COSTA RICA (*v. Patten*^{2 3}), Rio Sucio (*Rogers*); PANAMA, Chiriqui (*Ribbe*⁴, *Zahn*).—COLOMBIA¹; ECUADOR; PERU⁴.

After a close examination we are unable to discover any differences by which to recognize Mr. Butler's three species as distinct from each other. We possess the types of *E. umbracea* and of *E. cyclops*, and have compared these with that of *E. polyphemus* in the British Museum, and are satisfied as to their all belonging to the same species. The South-American race appears to be a trifle smaller; and the ocellus beneath at the apical angle of the secondaries is perhaps also smaller in an average number of specimens; the transverse lines, too, on the secondaries are usually closer together. But these points of difference break down when a series of specimens is examined.

The species is not unlike *E. satyrina*, differing in the shape of the wings, the more even edge of the secondaries, and in the generally darker tint of the wings beneath.

21. *Euptychia antonoe*.

Papilio antonoë, Cram. Pap. Ex. t. 60, f. E, F¹.

Euptychia antonoë, Butl. P. Z. S. 1866, p. 486².

Alis supra fuscis, lineis tribus indistinctis submarginalibus notatis: subtus alis dilutioribus et grisescentioribus, fasciis mediis duabus ferrugineis lineisque tribus subparallelis pone marginem externum; anticis oculo parvo apud angulum analem et posticis ocellis quinque ornatis, primo et quarto maximis, his cum quinto albo pupillatis, reliquis obsoletis.

Hab. GUATEMALA, forests of Northern Vera Paz, Choctum (*F. D. G. & O. S.*), Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*); PANAMA, Veraguas (*Arcé*), Lion Hill (*M^cLeannan*).—VENEZUELA; AMAZONS; GUIANA¹.

This is one of the largest species of the genus, and is distinguished by the pointed form of the primaries, the outer margin being in some male specimens slightly concave.

Central-American specimens are quite as large as southern ones, and usually have the wings of a rather browner tint beneath; but the difference is slight. In female specimens the anal spot of the secondaries beneath shows through on the upper surface of the wing.

22. *Euptychia nebulosa*. (Tab. VIII. fig. 10.)

Euptychia nebulosa, Butler, P. Z. S. 1866, p. 479¹, 1867, t. 12. f. 2².

Alis supra olivaceo-fuscis, lineis tribus submarginalibus notatis; anticarum margine externo paulo concavo: subtus alis dilutioribus, lineis duabus mediis transversis, tribusque ad margines externos, intima sinuata, ferrugineis; anticis oculo apicali albo pupillato; posticis ocellis quinque notatis, primo (albo bipupillato), quarto et quinto maximis.

Hab. PANAMA, Chiriqui (*Ribbe*), Lion Hill (*M^cLeannan*).—VENEZUELA¹.

This species, though much smaller than *E. antonoe*, has similar pointed primaries; and the neuration being also similar, it may be placed next that species. It is a rare insect in Central America, as only two specimens have as yet come under our notice. These agree fairly with Mr. Butler's type, though the apical ocellus of the primaries of the Lion-Hill example, a female, is almost obsolete.

- e.* Wings of both sexes opaque brown; upper discocellular of primaries long and directed forwards, middle discocellular straight, short, and also directed forwards; first subcostal branch emitted before the end of the cell, the second beyond it.

23. *Euptychia camerta*. (Tab. VIII. figg. 6, 7).

Papilio camerta, Cram. Pap. Ex. iv. t. 293. f. F¹.

Euptychia camerta, Butl. & Druce, P. Z. S. 1874, p. 335².

Papilio hermes, Fab. Ent. Syst. iii. p. 158³.

Euptychia hermes, Butl. & Druce, P. Z. S. 1874, p. 336⁴.

Papilio sosybius, Fab. Ent. Syst. iii. p. 219⁵.

Euptychia sosybius, Butl. P. Z. S. 1866, p. 474⁶; Strecker, Butt. N. Am. p. 149⁷.

Neonympha fallax, Feld. Wien. Ent. Mon. vi. p. 177⁸.

Euptychia fallax, Butl. & Druce, P. Z. S. 1874, p. 336².

Euptychia maimounè, Butl. Ent. Monthl. Mag. vi. p. 251, t. 1. f. 4¹⁰; Dist. Pr. Ent. Soc. 1876, p. xiii¹¹.

Alis supra fuscis: subtus dilutioribus, lineis duabus submarginalibus fuscis ornatis, interiore sinuata, fasciis duabus subparallelis, una ultra cellulam, altera intra eam transeuntibus; anticis ocellis quinque submarginalibus notatis (sæpe obsoletis), posticis ocellis sex ornatis, secundo et quinto maximis, et omnibus plerumque albo pupillatis.

Hab. NORTH AMERICA, Southern States, Texas⁷.—MEXICO, Tomasulapam (*Hedemann*, *Mus. Vind.*), Cordova (*Rümeli*), Oaxaca (*Fenochio*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Dueñas (*F. D. G. & O. S.*), San Gerónimo (*F. D. G. & O. S., Champion*), Zapote (*Champion*), Polochic and Chisoy valleys (*Hague*), Choctum (*F. D. G. & O. S.*); HONDURAS (*Mus. Brit.*); NICARAGUA⁴, Chontales (*Belt, Janson*), Costa Rica (*v. Pat-ten*²⁴⁹, *Gabb*¹¹); PANAMA, Chiriqui (*Arce*).—SOUTH AMERICA generally to Brazil.

With nearly a hundred specimens before us of this species, selected out of several times that number, we have vainly endeavoured to separate them into different races, for which no lack of names exist ready made for their reception. We have failed, however, to see how *E. camerta*, *E. hermes*, *E. sosybius*, *E. fallax*, and *E. maimounè* can be defined by any trustworthy characters so as to distinguish the one from the other. The submarginal spots of the secondaries vary very much; and though Central-American specimens show a tendency to have the outermost but one at each end of the row a well-formed and conspicuous ocellus, examples are not wanting where all the ocelli are nearly equal, this being the prevalent character of the Guianan and Brazilian insects. Other characters are equally fugitive; so that we find it impossible to follow Mr. Butler and others in their minute subdivision of this species.

The name *E. camerta*, which we adopt, is the oldest, and, resting as it does on Cramer's figure, is, on the whole, the most desirable one to use.

The species is quite one of the commonest of *Euptychiæ*, being found nearly everywhere throughout Central America, from an elevation of 5000 or 6000 feet to the sea-level.

We have figured two rather extreme forms, one (fig. 6) from the Polochic valley, the other (fig. 7) from Choctum.

24. *Euptychia phares*. (Tab. VIII. figg. 8, 9.)

Satyrus phares, Godt. Ene. Méth. ix. p. 491¹.

Neonympha phares, Westw. & Hew. Gen. Diurn. Lep. p. 375, t. 67. f. 4².

Euptychia phares, Butl. P. Z. S. 1866, p. 477³.

Alis supra fuscis, lineolis tribus subparallelis marginatis; anticis ocello unico in angulo apicali, posticis ocellis quatuor linea submarginali positus ornatis, primo et quarto maximis: subtus multo pallidioribus, lineis et ocellis multo magis distinctis, linea communi fusca extus sordide albido limbata et anticis plaga magna media fulva notatis.

Hab. PANAMA, Calobre (*Arcé*).—VENEZUELA³; BRAZIL¹.

Of this species we have a single female specimen, sent us from Calobre by Arcé, that now described and figured. This agrees closely with a series of examples from Brazil and Venezuela, showing that this insect, though apparently nowhere common, has a very extensive range.

25. *Euptychia harmonia*.

Euptychia harmonia, Butl. P. Z. S. 1866, p. 478, t. 39. f. 17¹.

Alis supra fuscis: subtus dilutioribus, lineolis tribus fuscis marginatis, fascia rufescenti-fusca communi in posticis trisinuata extra cellulas, altera per cellulas transeunte; anticis ocellis quatuor vel quinque ornatis, eo ad angulum apicalem majore, reliquis obsoletis; posticis ocellis quinque notatis, quarto maximo, secundo quoad magnitudinem proximo, reliquis fere obsoletis, sed omnibus albo pupillatis.

Hab. COSTA RICA, Irazu and Caché (*Rogers*); PANAMA, Chiriqui (*Ribbe*).—ECUADOR¹.

This species, which by its neuration belongs to the same group as *E. camerta*, was originally described from Ecuadorean specimens¹. Since then we have received a number of examples both from Costa Rica and from the neighbourhood of Chiriqui. These all agree accurately with the typical form from Ecuador.

f. Wings, especially the apical portion of the secondaries, more or less washed with shining blue in both sexes; first and second subcostal branches emitted before the end of the cell; middle discocellular angular, and emitting a short recurrent nervule.

26. *Euptychia ebusa*.

Papilio ebusa, Cram. Pap. Ex. iv. t. 292. f. F, G¹.

Euptychia ebusa, Butl. P. Z. S. 1866, p. 489².

Euptychia arnæa, Butl. & Druce, P. Z. S. 1874, p. 337 (ex Fabr.)³.

♂ alis supra pallide fuscis, lineis paginæ inferioris translucentibus, posticarum dimidio apicali late cæruleo: subtus dilutioribus; posticis ad marginem internum leviter cæruleo lavatis, lineolis tribus fuscis subparallelis marginatis, fasciis duabus ferrugineis, una ultra cellulas a costa anticarum ad marginem posti-

earum internum, altera per cellulas transeunte; anticis oculo unico apicali notatis, posticis ocellis quinque serie submarginali ornatis, primo et quarto maximis, tertio quarto confluyente.

♀ mari similis, sed area anticarum interna cum posticis fere omnino cyaneo tinctis.

Hab. NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*³), Irazu (*Rogers*); PANAMA, Veraguas (*Arceé*), Lion Hill (*M^r Leannan*).—SOUTH AMERICA to the Amazons valley; GUIANA¹.

This is a common South-American butterfly, occurring in numbers in collections from Guiana. It is also abundant on the Isthmus of Panama and thence northwards to Nicaragua. These do not differ from Guiana specimens, whence Cramer's types were procured.

Messrs. Butler and Druce³ follow Mr. Kirby in using Fabricius's name *E. arnæa* for this species; and they may be right in so doing. But as Fabricius, in his later works, considered *E. lea* of Cramer to be probably the same as his *E. arnæa*, the association of the latter name with *E. ebusa* is at least doubtful. We therefore adopt Cramer's title as more certain, and therefore preferable, one too that has been until recently almost universally used.

27. *Euptychia sericeella*. (Tab. VIII. figg. 20, 21.)

Euptychia sericeella, Bates, Ent. Monthl. Mag. i. p. 202¹; Butl. P. Z. S. 1866, p. 489².

♀ *E. ebusæ* similis, sed anticis cyano magis diffuso, ocellis posticarum subtus minoribus et linea transversa interna angustiore differt.

Hab. MEXICO, Orizaba (*Hedemann, Mus. Vindob.*); GUATEMALA, forests of Northern Vera Paz, Choctum (*O. S. & F. D. G.*¹).

It is quite possible that this insect, when more is known of it, will prove to be inseparable from *E. ebusa*. It is certainly not intermediate, as Mr. Butler suggests², between that species and *E. cluena* (Drury). Though Mr. Bates states that he described a male, the fact of both wings being suffused with blue shows, we think, that it was really a female specimen he had before him. This supposition is confirmed by our specimen, marked as the type, being a female and not a male. Though we have seen a male specimen in the Vienna Museum, we were not able to examine it with sufficient care to say how it differs from the same sex of *E. ebusa*, so that specimens of this sex still remain to be compared; and it is more than probable, judging from analogy, that the chief distinction between *E. sericeella* and *E. ebusa*, relied upon by Mr. Bates when describing the former, will disappear when the male sex is examined. Besides the greater amount of blue on the wings, females only differ from that sex in *E. ebusa* by the ocelli being smaller, and the inner of the two transverse bands beneath being narrower, both unimportant characters. The species is quite rare in Guatemala: we took a specimen in the forests of Vera Paz, north of Coban, at an elevation of about

1200 feet; and since our return a single example has been sent us from Choctum, in the same district.

We have figured and described the type from the forests of Northern Vera Paz.

- g.* Wings of male dead blue, of female brown, but wings of both sexes beneath always tinged with blue: first subcostal branch of primaries emitted before the end of the cell, the second just after it: upper discocellular very short; second strongly convex.

28. *Euptychia glaucina*. (Tab. VIII. figg. 18, 19.)

Euptychia glaucina, Bates, Ent. Monthl. Mag. i. p. 203¹.

♂ alis supra grisco-cyaneis, venis, costa et margine externo fusciscentibus: posticis lineolis duabus submarginalibus notatis; subtus pallide cyaneis, lineolis duabus submarginalibus et quatuor transversis rufescentifuscis ornatis; linea posticarum tertia ocellos quatuor includente, duos ad angulum apicalem et duos ad angulum analem.

♀ alis supra fuscis; posticis lineolis obsolete marginatis, subtus sicut in mare.

Hab. MEXICO, Jalapa (*Deppe*, *Mus. Berol.*), Potrero (*Hedemann*, *Mus. Vindob.*), Valladolid, Yucatan (*Gaumer*); GUATEMALA, Dueñas (*F. D. G. & O. S.*¹), Zapote, San Isidro, and Cahabon (*Champion*).

This is a northern representative of *E. lycidice*, differing, at a glance, from that species in the much greyer tint of the wings of the male. Until quite recently the only specimen known to us was one captured by us at Dueñas in 1861, which served as the type of Mr. Bates's description, and is the one now figured. Within the last few months we have received additional specimens from Yucatan, and also a good supply of examples from Mr. Champion, who captured them chiefly in the neighbourhood of Cahabon, though he also found it elsewhere. It would thus seem to have a considerable range, and in altitude is found from the sea-level to a height of 5000 feet.

- h.* Secondary wings beneath with a submarginal row of metallic spots or lines; first subcostal branch of primaries emitted before the end of the cell, the second after it.

*d*¹. Upper discocellular of primaries short, directed forwards.

29. *Euptychia philodice*. (Tab. IX. figg. 15, 16.)

Euptychia philodice, Godm. & Salv. P. Z. S. 1878, p. 264¹.

♂ alis supra fusco-brunneis; posticis macula conspicue irregulari fulva ultra cellulam, ocellis tribus submarginalibus absque pupillis; subtus rubescenti-brunneis, anticis lineis tribus subparallelis ferrugineis, fascia subtriangulari pallide fulva inter duas exteriores marginem internum versus; posticis linea valde sinuata per cellulam, altera extra eandem et extus fascia fulvida late limbata, ocellis duobus submarginalibus ad medium marginis externi, maculas argenteas sagittiformes includentibus, maculis quoque similibus ad marginem reliquum.

♀ mari similis, sed alis paulo dilutioribus et marginibus suis magis rotundatis.

Hab. COSTA RICA, Volcan de Irazu (*Rogers*).

This well-marked species belongs to the same group as *E. gemma*, with which *E. phocion* of the United States is usually associated, and has the apical angle of the secondaries produced as in *E. argentella* and *E. rogersi*. The peculiar tawny marks of the secondaries render the species very distinct from its allies. This marking on the upper surface is subject to some variation, being more restricted in some specimens and divided by the brown of the inner portion of these wings running through it longitudinally.

Mr. Rogers sent us a good series of specimens, all taken on the slopes of Irazu, in Costa Rica.

We have figured the type.

30. *Euptychia nelsoni*, sp. n.

Alis supra fusco-brunneis olivaceo tinetis, anticearum apicibus et posticearum marginibus obscurioribus, his maculas obsoletas nigras includentibus; subtus anticis fere unicoloribus fuscis, posticis paulo griseo-olivaceis, fascia lata recta valde distincta a costa ad angulum analem ducta albicante, et fascia altera interiore sinuata indistincta fusca, ornatis; ocellis duobus submarginalibus ad medium marginis externi, maculas argenteas sagittiformes includentibus, maculis quoque similibus ad marginem reliquum. Exp. 1.75 poll.

♀ mari similis, sed major; posticearum area interna fere ochracea, margine obscuro angustiore, et maculis submarginalibus nigris magis distinctis; subtus quoque fascia conspicua albicante absente distinguenda. Exp. 1.9.

Hab. GUATEMALA, Cerro de Zunil (*Champion*).

Of this pretty and distinct species Mr. Champion has recently sent us a good series of specimens, which he captured in the forests of the southern slope of the Cerro de Zunil, at an altitude of about 6000 feet above the sea. When exploring this mountain, Mr. Champion stayed at Las Nubes, a coffee-estate founded by the late Mr. William Nelson, an old friend of ours, after whom we have named the species.

In the series before us we trace a slight variation in size, and also in the distinctness of the dark margin of the secondaries from the rest of the wings. On the underside the conspicuous transverse band is broader in some specimens than in others; and in one example the middle portion has a few dark scales, rendering it less pure in colour. As regards the single female specimen, it agrees sufficiently with the males in every particular, except in wanting the pale band of the secondaries beneath, which is replaced by dark rusty red. As the position of this band is indicated, and as we see no other evidence pointing to the presence of a second species, we incline to the opinion that this female is the normal female of the males taken in the same woods. The difference, however, is more than is usually seen between the sexes of species of *Euptychia*. The nearest ally of *E. nelsoni* appears to be *E. philodice* of Costa Rica.

31. *Euptychia argentella*. (Tab. VIII. fig. 26.)

Euptychia argentella, Butl. & Druce, Cist. Ent. i. p. 98¹; P. Z. S. 1874, p. 337².

E. philodice similis, sed plerumque minor et posticis macula fulvida absente, subtus fascia flava anticearum et posticearum absentibus, linea transversa posticearum exteriore valde angulata et extrorsum (in specimine typico) flavido leviter limbata; ocellis omnibus multo minoribus.

Hab. GUATEMALA, Dueñas, Calderas, and Cerro de Zunil (*Champion*); COSTA RICA (*Van Patten*^{1 2}), Volcan de Irazu (*Rogers*); PANAMA, Chiriqui (*Arcé, Ribbe*).

Typical male examples of this species from Costa Rica are considerably smaller than those from Guatemala, and have a yellowish transverse mark on the secondaries, not seen or only faintly in the more northern insects. These differences, though fairly constant, are scarcely of sufficient importance to justify the division of the species. Chiriqui examples, one of which we have figured, agree with those from Costa Rica.

In a series of specimens from Zunil, recently received, further variation is also to be traced: in some examples the wings are more rounded than in others, and of a rich ferruginous tint; on the underside, too, the colour of the wings varies from ferruginous to almost grey, and the ocelli of the secondaries, well marked in some individuals, are almost obsolete in others.

As in *E. philodice* two, and sometimes three, blind ocelli are visible near the middle of the outer margin of the secondaries. This character distinguishes these species from *E. rogersi*, which shows only one such ocellus.

Some of Mr. Champion's Guatemala specimens were captured at elevations ranging between 5000 and 7000 feet above the sea.

32. *Euptychia rogersi*. (Tab. IX. figg. 13, 14.)

Euptychia rogersi, Godm. & Salv. P. Z. S. 1878, p. 265¹.

E. argentellæ similis, sed posticis supra ocello unico notatis; alis subtus magis fusciscentibus fascia inter strias transversas duas externas griseo-fusca; ocello magno unico ad angulum apicalem et maculis argenteis majoribus differt.

♀ mare pallidior, et alis striis ferrugineis paginæ superioris notatis.

Hab. COSTA RICA, Volcan de Irazu (*Rogers*¹).

The single ocellus of the secondaries, which shows on the upper surface as a black submarginal spot, at once serves to distinguish this species from its allies. The anal angle of the secondaries, as in *E. philodice* and *E. argentella*, is considerably produced, and even more so than in those species.

Mr. Rogers sent us four specimens of this insect, including both sexes. All were taken on the slopes of the Volcan de Irazu.

33. *Euptychia gemma*. (Tab. VIII. fig. 12.)

Neonympha gemma, Hübn. Zutr. Ex. Schm. p. 8, f. 7, 8¹.

Euptychia gemma, Butl. P. Z. S. 1866, p. 500²; Strecker, Butt. N. Am. p. 150³.

Euptychia cornelius, Butl. Journ. Linn. Soc. Zool. xiii. p. 122 (ex Fabr.)⁴.

Alis supra cinereis, posticis ocellis duobus indistinctis ad marginem externum; subtus ut supra fusco irroratis, anticis tribus, posticis duabus lineis ferrugineis transfasciatis, posticis duobus ocellis bipartitis et argenteo ornatis ad marginis externi medium, area circumjacente ferrugineo atomata, margine reliquo externo maculis argenteis sagittiformibus ornato.

Hab. NORTH AMERICA, Southern States¹, Texas³.—MEXICO (*Deppe*, *Mus. Berol.*); GUATEMALA, Dueñas, San Gerónimo and Polochic valley (*F. D. G. & O. S.*), San Gerónimo (*Champion*).

This is one of the few species of *Euptychia* which extends its range into the United States, where it appears to be not uncommon in Georgia, Florida, and Texas. In Guatemala it can hardly be called rare, being found in places situated between 3000 and 5000 feet above the sea.

In using Hübner's name for this species we follow Mr. Herman Strecker³, who rightly considers Fabricius's name *E. cornelius*⁴ too uncertain to be received.

We have figured a male from San Gerónimo.

34. *Euptychia pyracmon*. (Tab. VIII. fig. 27.)

Euptychia pyracmon, Butl. P. Z. S. 1866, p. 499¹; 1867, p. 109, t. 11. f. 10²; Butl. & Druce, P. Z. S. 1874, p. 337³.

E. gemmae valde affinis, sed major, alis supra paulo rufescentioribus et fasciis paginæ inferioris magis distinctis.

Hab. MEXICO, Oaxaca (*Mus. Brit.*¹) (*Koppe*, *Mus. Berol.*); GUATEMALA, Vera Paz (*Hague*), Cachil (*Champion*); COSTA RICA (*Van Patten*³); PANAMA, Chiriqui (*Zahn*).

This species is very closely allied to *E. gemma*, but differs in the few points indicated above. Its range does not correspond with that of *E. gemma*, as it is found at least as far south as Chiriqui, and even further, if a specimen in our collection said to be from Venezuela really came from that country. Its northern range, too, terminates in Southern Mexico, whereas *E. gemma* spreads over the Southern States.

Mr. Champion's specimens were taken from the hills above Cachil, in Vera Paz, at an elevation of between 3000 and 4000 feet above the sea.

el. Upper discocellular of primaries entirely absent.

35. *Euptychia hedemanni*. (*E. ithamna*, Tab. VIII. fig. 25; *E. vetones*, Tab. IX. figg. 17, 18.)

Cyllopsis hedemanni, R. Feld. Verh. k. k. zool.-bot. Ges. Wien, 1869, p. 474¹.

Euptychia ithama, Butl. Lep. Ex. p. 9, t. 4. f. 4²; Butl. & Druce, P. Z. S. 1874, p. 337³.

Euptychia vetones, Godm. & Salv. P. Z. S. 1878, p. 265⁴.

♂ alis anticis paulo falcatis, posticis angulatis angulum analem versus sensim dentatis; alis supra fuscis;

subtus undique fusco-nigro irroratis, fasciis duabus transversis ferrugineis, una per cellulas, altera ultra eadem, posticis ocello unico ad marginis externi medium punctisque argenteis apud marginem externum notatis.

♀ mari similis, sed major, anticarum apicibus minus acutis et alarum pagina superiore lineis transversis ferrugineis notata.

Hab. MEXICO, Potrero (*Hedemann*¹); GUATEMALA, San Gerónimo (*Hague*², *Champion*), Panima, Polochic valley, Cerro de Zunil, and Calderas (*Champion*); COSTA RICA (*Van Patten*³), Volcan de Irazu (*Rogers*⁴).

On seeing the type of *Cyllopsis hedemanni* in the Vienna Museum we at once recognized the species known to us as *Euptychia ithama*. Mr. Butler, in the corrections to his 'Lepidoptera Exotica,' states that *C. hedemanni* and *Taygetis kerea* are names of the same species; but this is not the case.

For a long time a single female specimen, the type of Mr. Butler's description, was the only one known to us; and until quite recently only females had come under our notice. Mr. Champion, however, has now sent us both sexes; and with the additional materials now before us we do not consider the Costa-Rican form, which we separated as *E. vetones*⁴, to be really distinguishable from the Mexican and Guatemalan insect. It is true that the transverse lines on the underside of *E. vetones* are rather more distinct than in *E. hedemanni*; but the difference is hardly sufficient to justify its separation. Of both forms we now possess a good series of specimens, including both sexes of each.

In Guatemala *E. hedemanni* ranges from 2000 feet above the sea to about 7000 feet, and is probably nowhere very common.

Note.—Besides the foregoing species, the names of a few others have been published, but which we have not yet been able to recognize. These names may apply to species unknown to us, or more probably refer to some of those which are here treated of. They are as follows:—

Neonympha lupita, Reakirt, Pr. Ac. Phil. 1866, p. 331. Near Vera Cruz and Orizaba, Mexico.

Neonympha epinephile, Felder, Reise d. Nov. Lep. i. p. 476. Mexico.

Neonympha pompilia, Felder, tom. cit. p. 479. Colombia and Mexico.

TAYGETIS.

Taygetis, Hübn. Verz. bek. Schmett. p. 55 (1816); Westw. & Hew. Gen. Diurn. Lep. p. 355.

As already hinted (*anteà*, p. 74), the limits between this genus and *Euptychia* are not so definite as could be wished; some of the species, especially those allied to *T. valentina*, having so strong a resemblance to some *Euptychiæ*, that were the whole of the species of the two genera fully examined some rearrangement of the position of certain species would result.

So far as *T. mermeria* is concerned, we have no doubt of its generic distinctness. In the genital armature of the male of *T. mermeria* differences are observable when compared with the same organs in *Euptychia*, the lateral hooks of the tegumen being developed in a remarkable way, being long slender rods curved like fish-hooks.

The palpi, too, of *T. mermeria* have the terminal joint much shorter than in *T. virgilia*; and the front legs of the male are densely hairy.

These points show that the whole group requires a very thorough examination, an undertaking beyond the scope of a faunistic work like the present.

We take the genus as usually understood, and much as it stands in Mr. Butler's 'Catalogue of Satyridæ in the British Museum.' The number of species it contains is difficult to estimate, so many of them being merely nominal ones. Mr. Butler in his Catalogue admitted twenty-seven; and he subsequently added several more in his 'Lepidoptera Exotica.' In our own collection we admit about twenty, of which some are of doubtful value. Within the limits of Central America we find nine species, of which only three reach Southern Mexico, the genus being strictly a tropical one.

a. Large species; median transverse band of secondaries straight or in a simple curve.

1. *Taygetis mermeria*.

Papilio mermeria, Cram. Pap. Ex. i. t. 96. f. B¹; iv. t. 289. f. E, F².

Taygetis mermeria, Hübn. Samml. ex. Schm. ii. t. 84³; Butl. Cat. Sat. B. M. p. 7⁴; Butl. & Druce, P. Z. S. 1874, p. 335⁵.

Faunus tenebrosus, Blanch. d'Orb. Voy. Am. Mérid. vi. p. 222, t. 32. f. 1, 2⁶.

Taygetis excavata, Butl. Cat. Sat. B. M. p. 8, t. 1. f. 1⁷.

Alis olivaceo-fuscis, anticarum apicibus valde productis, posticarum margine externo ad angulum analem plus minusve dentato: subtus alis pupuraseenti-fuscis aut ferrugineis, ad basin pallidioribus et undique fusco-nigro irroratis; anticis ocellis quinque submarginalibus ornatis; posticis linea recta transversa intus nigricante, extus dilutiore notatis ultra eam serie sex ocellorum linea fere recta positorum et linea submarginali persinuosa ornatis.

Hab. MEXICO (*Sallé*); GUATEMALA, Retalhuleu (*F. D. G. & O. S.*), Volcan del Zumbador (*Champion*); HONDURAS (*Mus. Brit.*⁷); NICARAGUA⁴ (*Belt, Janson*); COSTA RICA (*Endres, Van Patten*⁵, *Rogers*).—SOUTH AMERICA, to Brazil and Bolivia.

Though considerable diversity exists in the shape and coloration of the wings of specimens from different points in the wide range of this species, we are unable to group them in any definite manner so that each race should bear a separate name. The chief points of variation consist in the shape of the apex of the primaries, which in some specimens is produced to a sharp point; the anal angle of the secondaries in others is more deeply indentated, and these wings rather more produced and less rounded. The colour of the underside presents the greatest diversity; and the only constant character to be traced is the straightness of the transverse median band of the secondaries—a point of distinction between *T. mermeria* and *T. armillata*.

Geographically these differences are generally distributed as follows:—

In Guiana the primary wings are least produced and the secondaries most rounded. This form is represented on Cramer's plate 96¹, and must be considered the typical *T. mermeria*. This form also spreads into the Upper Amazons valley and to Ecuador. Here it meets and blends with an insect with the primaries produced to a point, a character to be found in this *Taygetis* from Mexico to Brazil, and which is represented in d'Orbigny's 'Voyage' as *Faunus tenebrosus*⁶; Cramer's plate 289 also represents this form from Surinam². In Central America the secondaries are somewhat produced and have the anal angle rather more conspicuously notched. This form is Mr. Butler's *T. excavata*⁷. But to show how slight this character is, we find that this entomologist has assigned to Central America the true *T. mermeria*⁵, a local form of it⁴, and also his *T. excavata*⁷, a statement the evidence of our specimens does not support.

The coloration of the underside of the wings resembles that of dead leaves; and as too close an adherence to one pattern and tint would to some extent render the likeness less complete, we find great diversity in this respect and only a general pattern retained by all the members of the species.

T. mermeria in Guatemala frequents the shades of the forest, flies close to the ground, and is very difficult to distinguish from the surrounding decayed leaves when settled on dead vegetation. It is only found in the low-lying country, and probably not much above an elevation of 1000 feet.

We have described a Nicaraguan specimen, where, however, the greatest diversity of colour of the underside exists in different individuals.

2. *Taygetis armillata*.

Taygetis armillata, Butl. Cat. Sat. B. M. p. 8, t. i. f. 3¹.

Taygetis jimna, Butl. Lep. Ex. p. 17, t. 7. f. 5².

T. mermeria similis, sed subtus serie ocellorum anticarum linea rectiore posita, fascia posticarum transversa magis curvata et margine externo in medio valde dentato distinguenda.

Hab. PANAMA, Lion Hill (*M. Leannan*²).—COLOMBIA¹; ECUADOR; BOLIVIA¹.

The only specimen we possess of this species from Central America is that sent us by M'Leannan, which formed the type of Mr. Butler's *T. jimna*¹. This is in very poor condition and much faded and worn, accounting for some of the differences Mr. Butler describes as separating it from the Colombian *T. armillata*. Of the latter insect we have specimens from the last-named country and from Ecuador; and on comparing these with the Panama butterfly and making allowance for the inevitable differences of colour found in species of this genus, we do not see how their distinction can be maintained; nor do we see any difference in the form of the wings of specific importance.

b. Medium-sized species; median band of secondaries beneath straight.

3. *Taygetis virgilia*.

Papilio virgilia, Cramer, Pap. Ex. i. p. 150, t. 96. f. C¹.

Taygetis virgilia, Butl. Cat. Sat. B. M. p. 9².

Taygetis chrysogone, Butl. & Druce, P. Z. S. 1874, p. 335 (nec D. & H.) ?³

Alis olivaceo-fuscis, posticarum margine externo serrato et ferrugineo plerumque late marginato; subtus alis rubescenti-fuscis, lincis duabus parallelis transfasciatis, una per cellulam, altera ultra eam, ultra hanc dilutioribus et ocellis obsoletis notatis, linea submarginali sinuata obsoleta quoque ornatis.

Hab. MEXICO, Valladolid, Yucatan (*Gaumer*); GUATEMALA, Polochic valley (*Hague*), Cahabon and Coatepeque (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*³); PANAMA, Volcan de Chiriqui (*Arcé*).—SOUTH AMERICA to Guiana¹ and Brazil².

This species varies considerably in coloration, especially in the tint of the underside of the wings, some specimens being dull brown, others of a rich rusty red. The secondaries, too, of many specimens have a very distinct ferruginous margin; but in others this passes into the general colour of the rest of the wings, a series showing a complete transition from one to the other. The rufous margin, however, is more commonly seen in specimens from northern localities.

We are not quite sure that the insect called *T. chrysogone* in Messrs. Butler and Druce's list of Costa-Rica butterflies³ is rightly referred to this species; but as we cannot trace any specimen of the true *T. chrysogone* in Dr. Van Patten's collection, and as we find a single specimen of *T. virgilia* having the rufous margin to the secondaries already spoken of, which, to a much greater extent, is present in *T. chrysogone*, we think it probable that this name was inadvertently applied to the Costa-Rica butterfly.

It is not always very easy to distinguish this species from *T. andromeda*. In Central America the presence in the secondaries of a well-defined subanal spot in the latter is one distinguishing character; and the greater straightness and better definition of the inner of the two transverse lines also helps in their differentiation. In South America these points of difference are not so apparent.

4. *Taygetis nympha*.

Taygetis nympha, Butl. Cat. Sat. B. M. p. 9, t. i. f. 7¹.

T. virgilæ affinis, sed anticarum apicibus magis acutis, et subtus linea submarginali multo magis sinuata distinguenda.

Hab. GUATEMALA, central valleys (*F. D. G. & O. S.*), Chuacus (*Hague*); HONDURAS (*mus. Brit.*¹); NICARAGUA, Chontales (*Janson*).

As Mr. Butler remarks, this species is somewhat intermediate between *T. chelys* of Brazil and *T. virgilia*. On the upperside it strongly resembles the former; but the

secondaries are never so deeply serrated. On the underside it is more like *T. virgilia*, having the outer transverse band nearly straight; but it does not appear ever to assume the rich ferruginous tint of *T. virgilia*, and the submarginal line is very much more sinuated.

The type of the species came from Honduras¹. We have described a specimen from Chuacus, our specimens having been taken in the vicinity.

5. **Taygetis andromeda.** (*Taygetis sylvia*, Tab. X. fig. 1.)

Papilio andromeda, Cramer, Pap. Ex. i. p. 149, t. 96. f. A¹.

Taygetis andromeda, Butl. Cat. Sat. B. M. p. 11².

Papilio thamyra, Cramer, Pap. Ex. iii. p. 83, t. 242. f. B³.

Taygetis thamyra, Butl. & Druce, P. Z. S. 1874, p. 335⁴.

Taygetis sylvia, Bates, Ent. Monthl. Mag. iii. p. 153⁵.

Taygetis uzza, Butl. Lep. Ex. p. 18, t. 7. f. 1⁶.

Taygetis leuctra, Butl. Cist. Ent. i. p. 19⁷; Lep. Ex. p. 149, t. 53. f. 3⁸; Butl. & Druce, P. Z. S. 1874, p. 335⁹.

Alis olivaceo-fuscis, linea submarginali obscuriore notatis; subtus alis purpurascenti- aut grisescenti-fuscis, interdum fulvo notatis, linea transversa ultra cellulas, altera minus distincta interiore, ocellis submarginalibus præcipue indistinctis, secundo posticarum maximo, linea submarginali valde sinuata; anticis interdum truncatis interdum acutis, posticis serratis.

Hab. MEXICO, Cordova (*Rümeli*), Oaxaca (*Fenochio*); GUATEMALA, San Gerónimo, Motagua valley and Retalhuleu (*F. D. G & O. S.*), Chuacus, Choctum, Polochic and Chisoy valleys (*Hague*), Chiacam, San Isidro, El Reposo, and Las Mercedes (*Champion*); NICARAGUA², Chontales (*Belt*); COSTA RICA (*Van Patten*^{2 4 9}); PANAMA, Chiriqui (*Arcé*), Veraguas (*Arcé*), Lion Hill (*M^cLeannan*⁵).—SOUTH AMERICA to Guiana^{1 3} and Brazil.

At first sight it seems difficult to believe that all the above names belong to but one species. Our collection, however, contains about 100 specimens selected from a much larger number; and on a close examination of these, we find intermediate forms between them all, leaving us no alternative but to unite them under one name. Even in form there is considerable variation: some have the apex of the primaries blunt, as though the points had been cut off; but between this and an almost pointed apex there is every gradation. All our Central-American specimens have the second ocellus from the anal angle on the underside of the secondaries more conspicuous than the rest; but as this is likewise exhibited in some of our South-American examples, it cannot be considered a really distinguishing feature. Some insects, especially those from Veragua, have a broad buff border on the underside of the primaries, in some cases extending halfway across the secondaries; this is also seen in some Guatemalan examples, one of which was described by Mr. Butler as *T. uzza*⁶. This form, too, reappears in South America mixed with others of more usual colour. The same is the case with the species described by Mr. Butler as *D. leuctra*^{7 8}, an

apparently well-marked form, which passes by obvious and gradual steps into such an extreme as *T. xenana**.

*T. sylvia*⁵ is perhaps the most distinct of all, the wings being pointed and the outer band of the primaries beneath parallel to the outer margin; but the passage between this and the ordinary *T. andromeda* seems quite complete.

T. andromeda is a fairly abundant species everywhere throughout its range up to an elevation of 3000 or 4000 feet.

c. Small species; median band of secondaries beneath in a waved line directed either in a straight or in a curved line across the wing.

6. *Taygetis keneza*.

Taygetis keneza, Butl. Lep. Ex. p. 19, t. 7. f. 4¹.

Alis fuscis, anticarum apicibus obtusis, posticis serratis; subtus anticis pallidioribus, posticis griseo-purpureis fasciis duabus mediis curvatis obscuris transeuntibus, serie submarginali ocellorum albo-pupillatis lineaque undulata obscura margini propiore notatis.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Chiriqui, Veragua (*Arcé*).—ECUADOR, GUIANA¹; BRAZIL.

Mr. Butler described this species from a Cayenne specimen in our collection. It appears to be a distinct species having a wide range. It comes near *T. valentina*, differing chiefly from that species in having the central band of the secondaries curved instead of in an undulating line across the wing; the bands too of the primaries beneath are broader, and the outer margin of the secondaries more dentate. We have only as yet seen four specimens from Central America; but these agree fairly with the Guiana type, due allowance being made for the variation found in members of this genus.

7. *Taygetis valentina*.

Papilio valentina, Cr. Pap. Ex. iii. p. 83, t. 242. f. A¹.

Taygetis valentina, Butl. Cat. Sat. B. M. p. 13².

Debis marpessa, Hew. Ex. Butt. iv. *Debis*, t. 1. f. 2³.

Taygetis zimri, Butl. Lep. Ex. p. 19, t. 7. f. 6⁴.

Alis fuscis, subtus pallidioribus et griseo-purpureo tinctis, lineis tribus curvatis obscuris transeuntibus, et serie ocellorum submarginali fere obsoleta notatis.

Hab. GUATEMALA, Chuacus (*Hague*⁴), Cerro Zunil and Las Mercedes (*Champion*); NICARAGUA, Chontales (*Belt*).—SOUTH AMERICA to Amazons valley³ and Guiana^{1 2}.

For several years two examples from Chuacus, from one of which Mr. Butler's description of *T. zimri* was taken, were all the Central-American specimens we possessed of this species. Mr. Champion has now sent us a good series, which prove *T. zimri* to

* Butl. Lep. Ex. p. 18, t. 7. f. 3.

be so closely allied to *T. valentina* of Cramer as to be practically inseparable from it. The chief difference in the type of *T. zimri* consists in the ocelli being all nearly obsolete, whereas in *T. valentina* the first, fourth, and fifth are usually the most prominent; but this is a character which breaks down when a series is examined. From *T. keneza* it chiefly differs in the bands of the wings beneath being narrower, and the outer margin of the secondaries less dentate.

8. *Taygetis kerea*.

Taygetis kerea, Butl. Lep. Ex. p. 11, t. 4. f. 2¹.

Alis fuscis, subtus cinereo, fulvo et fusco notatis, linea curvata transversa cellulas transeunte, altera ultra eam, tertiaque undulata submarginali, ocellis indistinctis intra et iis parallelis notatis.

Hab. GUATEMALA, Polochic valley (*F. D. G. & O. S.*¹), Chuacus, Chisoy valley (*Hague*).

This butterfly was described by Mr. Butler from specimens in our collection. It appears to be a scarce insect, as we have only received four examples of it. It belongs apparently to the same group as *T. valentina*, being, however, a much smaller insect.

d. Small species; a longitudinal fulvous patch on the secondaries beneath.

9. *Taygetis penelea*.

Papilio penelea, Cramer, Pap. Ex. ii. p. 8, t. 101. f. G¹.

Taygetis penelea, Butl. Cat. Sat. B. M. p. 13².

Alis fuscis, anticis fascia submarginali lata pallidior, maculas duas (aliquando tres) nigras includente; subtus anticis dilutioribus, ocello nigro apud angulum apicalem ornatis; posticarum regione costali nigricanti-fusca, fascia pallida bisecta, posticarum reliqua parte griseo-fusca, plaga fulva longitudinali ornata et ocellis quatuor notata, tertio obsoleto.

Hab. PANAMA, Lion Hill (*M'Leannan*).—SOUTH AMERICA² to Guiana¹ and the Amazons valley.

This is a well-known South-American species which just enters our fauna in the isthmus of Panama, whence M'Leannan sent us several specimens. These do not differ from southern examples, except that the fulvous longitudinal patch of the secondaries beneath is wider and more conspicuous.

PARAMECERA.

Paramecera, Butler, Cat. Sat. B. M. p. 98 (1868).

The single species of this genus is a rather peculiar-looking insect, recalling in the pattern of its coloration the common *Pararge megæra* of Europe. But its relationship with *Pararge* is not very close, the antennæ being less abruptly clubbed, the eyes less hairy, besides differences in the neuration of the wings. Like many species of *Pararge*, however, the male is distinguished by having a patch of compact scales on the lower side of the

median nervure of the primaries—a character which serves to distinguish it from all members of the genus *Euptychia*, which structurally is its nearest ally. The neururation of the primaries is much the same as in *Euptychia libye* and its allies, two subcostal branches being thrown off before the end of the cell (*antea*, p. 83). The differences between *Paramecera* and *Euptychia* consist in the greater distinctness of the club of the antennæ and in the terminal joint of the palpi being more slender and directed forwards at a less obtuse angle. They are not very important; and, considering the diversity of the members of the latter genus, the former might well be included in *Euptychia*. However, as the separation has been made, and as a further subdivision of *Euptychia* is almost inevitable, we are content to keep *Paramecera* distinct. The range of the genus is that of its single species as given below.

Mr. Butler, in his description of the genus, alludes to the upper surface of the wings being densely hairy, more so than in any other species of Satyrinæ. This peculiarity is not obvious to us, as our specimens, though certainly densely clothed with scales on the wings, are not more so than is the case with many other species.

1. *Paramecera xicaque*.

Neonympha xicaque, Reak. Pr. Ac. Phil. 1866, p. 336¹.

Paramecera xicaque, Butl. Cat. Sat. B. M. p. 99, t. 2. f. 5².

Alis rufescenti-fuscis, marginibus et anticarum plaga submediana obscurioribus; posticis rotundatis et bene dentatis; anticis ocellis duobus ad apices et posticis serie submarginali ornatis; posticarum limbo externo ad angulum analem rufescente, lineis fuscis margini subparallelis notato; subtus alis magis fulvescentibus; anticis lineis transversis rufis notatis, una per cellulam, altera ultra eam ad angulum analem ducta; posticis fascia lata transversa rufo limbata ornatis, ocellis paginæ superioris albo pupillatis et margine externo lineis duabus subparallelis ornatis.

♀ mari similis, sed major et plaga fusca anticarum submediana absente distinguenda.

Hab. MEXICO², near Vera Cruz (*W. H. Edwards*¹), mountains of Oaxaca (*Fenochio*).

This species, which seems restricted in its range to the southern States of Mexico, Vera Cruz, and Oaxaca, was first described by Mr. Reakirt from specimens obtained by Mr. W. H. Edwards in the vicinity of Vera Cruz. We have since obtained several examples from the eastern slope of the mountains of Oaxaca, which were sent us by Don A. Fenochio. The species is also represented in the collection of the British Museum²; and there was one in the Kaden collection bearing a MS. name of Herrich-Schäffer's. As already stated, the peculiarity of the colour of this species, coupled with the dark submedian patch on the primaries of the male, distinguishes it from all members of the genus *Euptychia*, to which it seems very closely allied.

LYMANOPODA.

Lymanopoda, Westwood, Gen. Diurn. Lep. p. 401 (1851).

The head quarters of this genus is the Andes of Colombia, Ecuador, and Peru, where

as many as twenty-seven species have been found. In Central America *L. euopis* is the sole representative, a species peculiar to the highlands of Costa Rica. Like *Pedaliodes*, *Pronophila*, and the allied genera, the median nervure of the primaries is not distinctly swollen at the base. Two subcostal branches are thrown off before the end of the cell; and there is a long strong recurrent nervule, the secondaries also showing a similar character as a short but distinct spur. In *Pronophila* a recurrent nervule is present in the primaries; but in the other above-mentioned genera it is obsolete.

1. **Lymanopoda euopis.** (Tab. IX. figg. 7, 10 ♂, 11, 12 ♀.)

Lymanopoda euopis, Godm. & Salv. P. Z. S. 1878, p. 266.

♂ alis fusco-nigris, anticis ocellis quinque transversis albo pupillatis in serie bicurvata in area inter cellulam et marginem externum nigris; posticis quinque ocellis ultra cellulam ornatis; subtus ferrugineo-fuscis, ocellis in fascia ochraceo-fusca (marginibus nigricantibus valde sinuatis) positis, macula subtriangulari flavescente intra cellulam apud finem ejus, fasciis transversis sinuosis rubiginosis serieque punctulorum nigrorum ultra cellulam albo pupillatorum notatis.

♀ mari similis, colore fusco dilutiore, anticarum ocellis in dimidio apicali majoribus in fascia lata male definita flava positis; posticis in exemplis quibusdam dimidio apicali fulvis, subtus flavescens.

Hab. COSTA RICA, Volcan de Irazu and Cache (*Rogers*).

Mr. Rogers first found this species in the mountains of Irazu in Costa Rica, whence he subsequently sent us several specimens of both sexes. It is the only species of the genus with which we are acquainted that is found in Central America. It is very different from all others, and may be readily recognized by the prominent row of submarginal ocelli, which are most conspicuous in the females. In this sex some diversity of colour seems to prevail. The first specimen received, which is that represented on our Plate, has the distal half of the secondaries tawny, the blind ocelli showing clear and distinct from the dark proximal half of the wings. In another female example the wing is more uniform in colour, the distal half being hardly lighter than the rest and the ocelli indistinct. As this second specimen resembles the male, we suppose the first to be abnormally coloured.

PEDALIODES.

Pedaliodes, Butler, Ann. & Mag. Nat. Hist. ser. 3, xx. p. 267 (1867).

Of this genus upwards of eighty species have been described, mostly from the Andean and Subandean regions of Colombia, Ecuador, Peru, and Bolivia; of these only seven occur within our borders, and none of them further north than Guatemala, where two species are found. The genus to a great extent takes the place of *Erebia* and its allies of the mountainous regions of the northern hemisphere. Hewitson, with whom these butterflies were always favourites, included them with *Oreoschistus* and several other smaller groups in the genus *Pronophila*; but Mr. Butler's separation of them is, we think, fully justified. The primaries have no recurrent nervule; the eyes are distinctly hairy; and the median nervure of the primaries is not swollen at its base.

1. *Pedaliodes manis*.

Pronophila manis, Feld. Reise d. Nov., Zool. ii. Lep. Th. iii. p. 469¹.

Pedaliodes manis, Butl. & Druce, P. Z. S. 1874, p. 337².

Alis nigro-fuscis, anticis limbum externum versus dilutioribus; subtus ferrugineo-fuscis, fascia lata submarginali pallidiore, interne valde curvata, et atomis albescentibus tinctis, margine interno ferrugineo.

Hab. COSTA RICA (*Van Patten*²).—COLOMBIA¹; VENEZUELA; ECUADOR.

We have a single example of this species which came in Van Patten's collection from Costa Rica. It agrees fairly with some of the South-American specimens, though, like most members of this genus, individuals differ slightly from each other. In some the amount of the rufous marking on the underside at the anal angle is greater and more concentrated than in others; the submarginal line varies also in its distinctness. Dr. Felder's specimens came from the neighbourhood of Bogota, whence we have examples, and also from the Sierra Nevada of Santa Marta, and from Merida in Venezuela: these latter have a rather conspicuous ocellus near the anal angle of the secondaries beneath, and may be referable to another species.

2. *Pedaliodes pisonia*. (*Pedaliodes dejecta*, Tab. IX. fig. 4.)

Pronophila pisonia, Hew. Trans. Ent. Soc. ser. 3, i. p. 6, t. 3. f. 21¹.

Pedaliodes pisonia, Butl. Cat. Sat. B. M. p. 173².

Pronophila dejecta, Bates, Ent. Monthl. Mag. i. p. 179³.

Pedaliodes lithochalcis, Butl. & Druce, Cist. Ent. i. p. 100⁴; Butl. & Druce, P. Z. S. 1874, p. 338⁵.

Alis supra fuscis fere unicoloribus, marginibus externis paulo dilutioribus; subtus pallidioribus, anticis interdum angulum analem versus ferrugineo tinctis et fasciis indistinctis transfasciatis, una per cellulam altera ultra eam transeuntibus; posticis nigro irroratis, fascia indistincta valde sinuata ultra cellulam ornatis, ocello unico ad angulum analem quoque notatis.

♀ mari similis, sed major et coloribus alarum paginæ inferioris multo magis distinctis.

Hab. GUATEMALA, Polochic valley (*F. D. G. & O. S.*³); COSTA RICA (*Van Patten*^{4 5}), Volcan de Irazu and Rio Sucio (*Rogers*); PANAMA, Chiriqui (*Arcé*).—VENEZUELA^{1 2}.

Mr. Bates described a single specimen of this butterfly obtained by us in the valley of the Polochic, Guatemala, under the name *Pronophila dejecta*³. Van Patten subsequently sent examples of the same insect from Costa Rica, to which Messrs. Butler and Druce gave the name *P. lithochalcis*⁴, comparing it with *P. pisonia*. We have received specimens from Mr. Rogers from the Rio Sucio and the Volcan de Irazu in Costa Rica, and also from Arcé from Chiriqui; and thus we possess a considerable series from these various sources. On a close examination of them we are unable to discriminate more than one species. Though there is a slight variation in the intensity of the mottled marking of the under surface of the wings, this does not seem to be peculiar to any locality. Again, comparing examples of the Central-American insect with Hewitson's types of *Pedaliodes pisonia* from Venezuela in the British Museum, we do not see how they

can be separated. Mr. Butler placed *P. dejecta* as a synonym of *P. pisonia*; if he is right in so doing (and we think he is), it follows, almost necessarily, that *P. lithochalcis* of Costa Rica falls under the same category.

3. *Pedaliodes perperna*.

Pronophila perperna, Hew. Trans. Ent. Soc. ser. 3, i. p. 16¹.

Pedalioides perperna, Butl. & Druce, P. Z. S. 1874, p. 337².

Alis fuscis, anticis oculo nigro albo pupillato et rufo circumcincto prope angulum analem (aliquando absente); subtus rufo-fuseo irroratis, fascia lata submarginali pallidiore, anticis et posticis oculo albo pupillato apud angulos anales, anticis quoque puncto albesciente ad angulum apicalem.

Hab. COSTA RICA (*Van Patten*²).—VENEZUELA².

Van Patten sent a single female specimen from Costa Rica, which we refer to this species. It agrees closely with our Venezuelan examples; the ocellus, however, at the anal angle of the primaries, both above and below, is surrounded with rufous, which appears only to a very limited extent in our Venezuelan examples; but we consider it undoubtedly belongs to the same species.

4. *Pedaliodes napæa*. (Tab. IX. figg. 2, 3.)

Pedaliodes napæa, Bates, Ent. Monthl. Mag. i. p. 179¹.

Alis fuscis, marginibus dentatis, fascia lata submarginali in anticis dilutiore, in posticis ferruginea; subtus fuscis ferrugineo irroratis, fasciis paginæ superioris pallide notatis, oculo nigro albo pupillato angulum analem versus indistincte indicato.

Hab. GUATEMALA, San Gerónimo (*F. D. G. & O. S.*¹, *Champion*), Calderas and Cerro Zunil (*Champion*).

We only obtained a single example of this species during our stay in Guatemala, and this unfortunately in poor condition; but Mr. Champion has lately sent us several beautiful fresh specimens taken at various altitudes (ranging from 3500 feet to 6000 or 7000 feet). It is very distinct from any other species known to us; and, so far as we are aware, it is peculiar to the highlands of Guatemala.

5. *Pedaliodes hulda*. (Tab. IX. figg. 7, 8.)

Pedaliodes hulda, Butl. & Druce, Cist. Ent. i. p. 99¹; P. Z. S. 1874, p. 338².

Alis anticis nigro-fuscis, posticis marginibus externis prope angulum analem fulvescentibus et linea obscura submarginali notatis; subtus ut supra, sed anticis lineis tribus transversis rubiginosis marginibus externis subparallelis, una submarginali, altera interiore sed ultra cellulas, tertia interius posita; posticis triente anali ferrugineo, striga interrupta transversa flava eum transeunte, ocellis duobus angulum analem versus.

Hab. COSTA RICA (*Van Patten*^{1 2}), Volcan de Irazu (*Rogers*).

Mr. Butler described this species from a broken specimen in Mr. Druce's collection,

sent by Van Patten from Costa Rica ; since then we have received a considerable series from the volcano of Irazu in the same country. Individuals show but little variation ; some, however, have the outer margin of the secondaries on the upperside slightly rufous, whilst others are of a uniform brown. Probably its closest allies are *P. ocellifera* of Colombia and Venezuela and *P. polusca* of Ecuador and Bolivia ; but it differs from both of these in the absence of the submarginal row of ocelli on the underside of the secondaries and in the greater amount of rufous colouring towards the anal angle.

6. *Pedaliodes cremera*. (*P. cremona* (err.), Tab. IX. figg. 3, 4.)

Pedaliodes cremera, Godm. & Salv. P. Z. S. 1878, p. 267¹.

Alis fuscis, anticis integris, fascia lata submarginali costam versus ampliore fulva, posticis marginibus sinuatis ; subtus ferrugineo-fusco irroratis, fascia fulva anticarum ut in pagina superiore, ocello nigro albo-pupillato in ea inter ramos medianos primum et secundum notatis, fascia pallida curvata ultra cellulam, ocello nigro inter ramos medianos primum et secundum, duobus minoribus ad angulum analem propius, omnibus albo pupillatis ornatis.

Hab. COSTA RICA, Volcan de Irazu (*Rogers*¹).

This large species, at present only known to us from a single worn example sent us from Costa Rica by Mr. Rogers, seems to be allied to *Pronophila pasicrates*, Hew., described from a specimen the origin of which was not known. The position of the broad fulvous submarginal band of the primaries is similar in both insects ; but in *P. cremera*, instead of being oval, the inner edge is concave, and the band itself runs out to the costa on the one side and the inner margin on the other. The underside of *P. cremera* appears to be generally paler, and the ocelli of the anal angle of the secondaries much more conspicuous.

7. *Pedaliodes triaria*. (Tab. IX. figg. 5, 6.)

Pedaliodes triaria, Godm. & Salv. P. Z. S. 1878, p. 266¹.

Alis fuscis, fascia arcuata fulva a costa anticarum ad medium marginis externi posticarum extendente, anticis punctis subapicalibus quatuor coloris ejusdem ; subtus fuscis, nigro irroratis, anticis fascia paginæ superioris latiore, punctisque quatuor subapicalibus albis, posticis ad apicem flavescentibus et ocellis sex (albo pupillatis) submarginalibus ornatis.

Hab. COSTA RICA, Volcan de Irazu (*Rogers*¹).

Allied to *P. praxithea* from Ecuador, but differs in having its primaries more pointed at the apex ; the tawny bands are narrower and of a paler colour ; beneath the surface is uniform brown mottled with black, the submarginal ocelli of the secondaries being absent in *P. praxithea*. The original specimen from which our description was taken was obtained by Mr. Rogers in the volcano of Irazu, whence he subsequently sent other examples.

GYROCHEILUS.

Gyrocheilus, Butler, Ann. & Mag. Nat. Hist. ser. 3, xx. p. 267 (1867).

This genus is closely allied to *Pedaliodes*, differing chiefly in the shorter and broader cell of the primaries, in its rounded wings, and long porrect palpi. The eyes, too, are smooth, whereas in *Pedaliodes* they are distinctly hairy. The only species we are acquainted with appears restricted in its range to the highlands of Southern Mexico; but a second has been described by Mr. W. H. Edwards from Arizona as *G. tritonia**.

1. *Gyrocheilus patrobas*. (Tab. X. fig. 5.)

Pronophila patrobas, Hew. Trans. Ent. Soc. 1862, p. 16, t. vi. ff. 40, 41¹; Ex. Butt. *Pronophila*, t. iv. f. 20².

Gyrocheilus patrobas, Butl. Ann. & Mag. Nat. Hist. ser. 3, xx. p. 267³.

Alis fuscis, anticis marginibus externis pallidioribus, punctis tribus (aliquando quatuor) submarginalibus albis; posticis fascia submarginali rufa, angulum analem versus multo latiore; subtus ut supra, sed anticis ocellis nigris tribus (aut quatuor) submarginalibus albo pupillatis, apicibus griseo tinctis, posticis fascia submarginali purpureo-grisea, ferrugineo irrorata, et introrsum maculis albidis notata.

Hab. MEXICO¹, Oaxaca (*Fenochio*).

Besides the Mexican type specimens of this beautiful species in Hewitson's collection we have seen others in the Berlin Museum, and we also possess a good series (one of which is figured) sent us by Don A. Fenochio from the eastern slope of the Cordillera of Oaxaca; and we believe this species to be restricted in its range to the highland forests of Southern Mexico. All the specimens we have seen are fairly constant in their markings; but the number of the ocelli of the primaries beneath varies, some having only three whilst others have four.

OXEOSCHISTUS.

Oxeoschistus, Butler, Ann. & Mag. Nat. Hist. ser. 3, xx. p. 268 (1867).

The members of this genus were included in *Pronophila*, until Mr. Butler separated them in 1867. Apart from the general aspect of the different species of *Oxeoschistus* from those of *Pronophila*, there seems to be a constant difference in the form of the palpi, which in the former are less prominent, and the terminal joint shorter and more slender. The other differences are chiefly in the shape of the wings and their colour and markings.

Sixteen species of *Oxeoschistus* have now been described, the Andes of Venezuela, Colombia, Ecuador, and Peru being their headquarters. In Central America we now know of eight species, three only of which are found as far north as Guatemala, the remainder belonging to the highlands of Costa Rica and Chiriqui. One species (*O. puerta*) is also found in the northern parts of South America.

* Trans. Am. Ent. Soc. v. p. 18.

1. *Oxeoschistus hilarus*. (Tab. X. figg. 14, 15.)

Pronophila hilara, Bates, Ent. Monthl. Mag. i. p. 178¹.

Alis fusco-brunneis, maculis submarginalibus fulvis serie duplici notatis, posticis inter has seriem ocellorum nigrorum (marginem costalem versus fere obsoletam) includentibus; subtus pallidioribus, anticarum apicibus ferrugineis maculis sordide albis notatis, inter ramos medianos maculis ovatis, punctis nigris divis, fulvis ornatis; posticarum venis, stria per cellulam, et altera ultra eam ochraceo-albis notatis, fascia quoque late ultra cellulam fulva, margine externo ochraceo valde sinuato et ocellos nigros albo pupillatos linea fere recta positos includente, ornatis.

Hab. GUATEMALA, Volcan de Fuego and Quezaltenango (road to coast) (*F. D. G. & O. S.*¹), Cerro Zunil and Purula (*Champion*).

This species was first described by Mr. Bates from specimens obtained by us in the high oak-forest of the Volcan de Fuego, 6000 feet above the sea, and also in similar forest on the road to the Pacific coast from the city of Quezaltenango. We only obtained three examples; and these were all that had come under our notice, until Mr. Champion sent us one from Purula, in the department of Vera Paz, and shortly afterwards a good series of specimens from the Cerro de Zunil, where he found them in profusion at an altitude of from 5000 to 6000 feet in damp forests at no great distance from where our Quezaltenango specimen was captured.

The series we now possess shows that the species is of fairly stable character. In one specimen, however, the double row of fulvous spots on the secondaries is becoming obsolete, whilst in the Purula example the two bands are confluent near the anal angle; and it thus resembles the next species, *O. euryphile*, more than the ordinary type. *O. hilarus* is probably restricted in its range to the highland forests of Guatemala, its place being taken in similar districts in Costa Rica by *O. euryphile*.

Our figure represents one of the types captured on the Quezaltenango road in September 1862.

2. *Oxeoschistus euryphile*.

Oxeoschistus euryphile, Butl. Cist. Ent. i. p. 73¹; Butl. & Druce, P. Z. S. 1874, p. 338².

Alis fuscis, fascia late submarginali flavo-fulva ab angulo anali posticarum apicem anticarum versus extendente, et ocellis nigris irregulariter notata, in maculas quoque subrotundas ad costam anticarum divisa; subtus anticis fuscis, apicibus et ramo mediano cinereis, maculis submarginalibus ut in pagina superiore, posticis ferrugineo-fuscis, stria flavoscente transversa ocellata ultra cellulam, altera interiore angustiore, vena mediana, macula ad cellulæ finem, et margine interno flavoscenti-cinereis.

Hab. COSTA RICA (*Van Patten*^{1 2}), Irazu (*Rogers*).

A single example of this species, sent by Van Patten from Costa Rica, was described by Mr. Butler from Mr. Druce's collection. Since then we have received numerous specimens from the mountains of Irazu forwarded by Mr. Rogers, showing that it is an inhabitant of the highlands, where it appears to take the place of the last species. So far as we know, its range is restricted to this country.

The broad submarginal orange band distinguishes it at once from *O. hilarus*, which has a double row of spots; the two species, however, bear a great resemblance to each other beneath.

3. *Oxeoschistus tauropolis*.

Pronophila tauropolis, Doubl. & Hew. Gen. Diurn. Lep. t. 66. f. 1¹; Bates, Ent. Monthl. Mag. iii. p. 157².

Pronophila latifica, Bates, Ent. Month. Mag. i. p. 164³.

Oxeoschistus cothon, Butler & Druce, P. Z. S. 1874, p. 338⁴ (partim).

Alis fuscis, anticis macula magna apud ramum medianum, altera minore in costa ultra cellulam, aliisque quatuor margini externo subparallelis, limonaceis; posticis plaga magna, margine externo valde sinuata mediam alam occupante; subtus anticis fere ut supra, sed dilutioribus, et ad apicem rufo-fuscis, posticis fulvo-fuscis, fasciis duabus ochraceo-albis transeuntibus (exteriore extus valde sinuata, intus pallide feruginea) et seriem ocellorum includentibus, quorum tribus mediis minutissimis.

Hab. MEXICO¹, Cordova (*Rümeli*), Jalapa (*Deppe*, *Mus. Berol.*), Oaxaca (*Fenochio*); GUATEMALA, Polochic valley (*F. D. G. & O. S.*³), Cerro Zunil (*Champion*), Chuacus, San Gerónimo, Chisoy valley (*Hague*); NICARAGUA, Chontales (*Belt*); COSTA RICA? (*Van Patten*⁴).

This upland species is an inhabitant of Mexico, Guatemala, and Nicaragua; and if the testimony of Dr. Van Patten is to be depended upon, it extends into Costa Rica, as some of the specimens in his collection from that country belong to this northern form.

All the examples, however, that Rogers took belong to the more southern race described below; and we think it just possible that Dr. Van Patten's may have come from Guatemala, as he also travelled in that country.

O. tauropolis was originally described by Doubleday and Hewitson¹ from Mexican specimens, and is well known as a characteristic butterfly of the highlands of the southern part of that country. It was subsequently described by Mr. Bates from specimens we brought from Guatemala³ as *P. latifica*; but soon afterwards its identity with *P. tauropolis* was acknowledged². Oak-forests of considerable elevation are the favourite resort of this species.

4. *Oxeoschistus cothon*. (Tab. X. figg. 10, 11.)

Oxeoschistus cothon, Salv. Ann. & Mag. Nat. Hist. ser. 4, vii. p. 413¹; Butl. & Druce, P. Z. S. 1874, p. 338².

O. tauropoli similis, sed anticis punctis duobus conscriptis ad apicem, altero inter ramum secundum et tertium venæ medianæ; posticarum macula limonacea majore, subtus stria per cellulæ finem latiore et ad basin propius transeunte.

Hab. COSTA RICA (*Van Patten*²), Irazu (*Rogers*); PANAMA, Chiriqui (*Arcé*¹).

This is a slightly modified form of the preceding species, differing, however, in the

primaries having two additional apical yellow spots, and another between the second and third branches of the median nervure; the spot, too, on the hind wing is larger, and, beneath, the band passing through the cell of the secondaries is wider and occupies a larger portion of the cell. This species or race seems to be fairly constant in these points of difference, which are of no great value, but, with the exception of some of Dr. Van Patten's specimens already referred to, seem to be associated with a distinct area; and therefore, to give this apparent fact prominence, it is as well that the two races should bear distinct names.

In Costa Rica *O. cothon* appears to be common, as Rogers sent us many specimens. It is also probably equally abundant as far south as the Volcan de Chiriqui.

5. *Oxeoschistus puerta*.

Pronophila puerta, Westw. Gen. Diurn. Lep. p. 358¹.

Pronophila puerta, Hew. Ex. Butt. (*Pronophila*) t. 2. ff. 10, 11²; Butl. & Druce, P. Z. S. 1874, p. 338³.

Alis fuscis, fascia fulva submarginali, linea mediana punctorum nigrorum ab angulo anali posticarum ad apicem anticarum extendente; subtus anticis ut supra, sed dilutioribus, posticis ferrugineis, linea duplici transversa argenteo-alba, extrorsum valde serrata, et ocellos albo pupillatos continente, striaque altera interiore notatis.

Hab. COSTA RICA (*Van Patten*³).—COLOMBIA²; VENEZUELA¹.

Van Patten sent a single specimen from Costa Rica which agrees closely with our Venezuelan and Colombian examples of this species. The three species *O. puerta*, *O. simplex*, and *O. submaculatus* are all very closely allied. The first appears to have the widest range and extends from Venezuela and Colombia to Central America as far north as Costa Rica. It has a strongly marked row of black spots in the middle of the fulvous band of both wings; the ocelli beneath in the posterior wings are far more conspicuous. *O. simplex* is an Andean form, ranging from Ecuador into Colombia, and differs from the preceding chiefly in the median row of spots in the fulvous band being evanescent, with the exception of one or two towards the anal angle of the secondaries; beneath, the transverse white marking of the posterior wings is more faint and the ocelli less prominent. *O. submaculatus*, which seems to be restricted to Costa Rica, has the apical portion of the submarginal fulvous band of the primaries very narrow at the apex, and never reaching the costa. The median row of ocelli in this band are either altogether absent or in some specimens only faintly indicated in one or two places.

6. *Oxeoschistus submaculatus*. (Tab. X. figg. 12, 13.)

Oxeoschistus submaculatus, Butl. & Druce, P. Z. S. 1874, p. 338¹.

O. puerta similis, sed fascia fulva anticarum apud costam angustissima et haud eam attingente, ocellis medianis

omnino (aut fere) absentibus; subtus area basali anticarum obscuriore et ocellis intra lineam duplicem posticarum minoribus.

Hab. COSTA RICA (*Van Patten*¹), Irazu (*Rogers*).

Very closely allied to *O. puerta* of Colombia, and *O. simplex* of Colombia and Ecuador; it differs, however, chiefly in the submarginal fulvous band being broader on the secondaries, whilst it becomes very narrow towards the costa of the primaries, which it does not quite reach. Most of our Costa-Rican specimens are either destitute of or only have one or two ill-defined black spots on this band. Beneath also it is very similar to *O. simplex*, but has the inner portion of the primaries blackish brown instead of ferruginous.

The original description was based upon a single specimen in Dr. Van Patten's collection. We have since received several other examples, all agreeing with the type.

7. *Oxeoschistus rogersi*. (Tab. IX. figg. 1, 2.)

Oxeoschistus rogersi, Godm. & Salv. P. Z. S. 1878, p. 267¹.

Alis fuscis, anticis fascia submarginali venis divisa et parte posteriore maculas disjunctas formante, iis inter ramos medianos et radiales superiores fusco notatis, ciliis albescentibus; subtus anticis ut supra, sed dilutioribus et maculis minus definitis, posticis fusco-fulvis, serie ocellorum submarginalium maculisque variis per alam sparsis argenteo-albis.

Hab. COSTA RICA, Irazu (*Rogers*¹); PANAMA, Chiriqui (*Mus. Staudinger*).

The first example of this insect was obtained by our collector Mr. Rogers from the mountains of Irazu, in Costa Rica. Soon after the receipt of this specimen Dr. Staudinger sent us another to name from the neighbourhood of Chiriqui. These are the only ones we have seen at present. Its nearest ally is *O. phaselis* (Hew.), a species placed in the genus *Pronophila* by Hewitson, and subsequently in *Dædalma* by Mr. Butler, but which, in our opinion, ought to be removed to *Oxeoschistus*. From this *O. rogersi* differs at first sight in the tawny markings on the primaries, those wings of *O. phaselis* being of a uniform brown. On the underside the two are very nearly alike.

8. *Oxeoschistus gigas*. (Tab. X. figg. 8, 9.)

Oxeoschistus gigas, Godm. & Salv. P. Z. S. 1877, p. 62¹.

♀ alis fuscis, anticis punctis submarginalibus quinque albis, aliis duobus interioribus marginem internum versus, posticis marginibus late fulvis, venis fuscis divisis, et puncto nigrescente inter ramos medianos primum et secundum notatis; subtus anticis ut supra, sed apice fulvo tincto et maculis indistinctis albidis notatis, posticis fulvescentibus externe pallidioribus, ocellis subapicalibus indistinctis serie positis et maculis variis albidis per alam notatis.

Hab. GUATEMALA, Aceytuno (*Rodríguez*¹), Purula (*Champion*).

The type specimen of this fine species was given to Salvin by Don Juan Rodriguez,

who had it in a case with other insects hung on a wall of a room in his house at Aceytuno, near the city of Guatemala. As far as could be ascertained, this specimen was captured in the vicinity of the hacienda. Since then Mr. Champion has sent us a fine fresh specimen which he took near Purula, in Vera Paz, at an elevation of between 4000 and 5000 feet above the sea. This second example agrees accurately with the type. The species is a remarkably distinct one, as the figure will show, and is the largest of its genus. It is probably restricted in its range to the highland forests of Guatemala, but is nowhere common.

PRONOPHILA.

Pronophila, Westwood, Gen. Diurn. Lep. p. 357 (1851, partim); Butl. Ann. & Mag. N. H. ser. 3, xx. p. 266.

Pronophila, as restricted by Mr. Butler, is a compact genus, containing nine not very very well-defined species, which are found throughout the Andes as far south as Bolivia, one species occurring in our region. The palpi in this genus are very prominent, the terminal joint being directed forwards; the median joint is densely clothed with long hair-like scales. As in *Oxeoschistus*, the middle discocellular nervule of the primaries is bent to a right angle about the middle, where it emits a strong recurrent nervule; the lower discocellular is gradually curved outwards. The upper discocellular is short in these two genera, as also in *Drucina*, and directed slightly forwards; and the eyes in all are densely hairy.

1. *Pronophila timanthes*. (Tab. X. figg. 6, 7.)

Pronophila timanthes, Salv. Ann. & Mag. Nat. Hist. ser. 4, vii. p. 412¹; Butl. & Druce, P. Z. S. 1874, p. 338².

Alis nigro-fuscis, anticis maculis elongatis submarginalibus quinque rufescentibus medialiter ocellatis; subtus anticis ut supra, sed dilutioribus et ocellis cyaneo pupillatis; posticis griseo-fuscis, fasciis indistinctis obscurioribus transvittatis ocellisque submarginalibus serie fere obsoleta notatis.

Hab. COSTA RICA (*Van Patten*²), Irazu (*Rogers*); PANAMA, Chiriqui (*Arcé*¹).

At the time we described this species it was the only known one of its genus which differed from all others in having the submarginal row of elongated rufous spots on the primaries; but a short time ago Mr. Buckley brought specimens of a similar insect from Granadillas, in Ecuador, which has the same character, and is perhaps hardly specifically distinct. The only apparently constant differences we can trace are in the rufescent spots of the primaries of the Ecuador race being restricted to the outside of the ocelli instead of passing inside them as in *P. timanthes*; the secondaries, too, of the latter have a rather less indentated outer margin.

P. timanthes is the only representative of *Pronophila* in Central America, and is

restricted in its range to the highlands of Costa Rica and the volcano of Chiriqui. Our types came from the latter district; but we have from time to time received a good series from the former country, where this would appear to be not uncommon.

DRUCINA.

Drucina, Butler, Cist. Ent. i. p. 72 (1872).

A genus closely allied to *Pronophila*, of which up to the present time only a single species from the highlands of Costa Rica was known. We now add a second species from Guatemala. The most obvious distinction between *Drucina* and *Pronophila* is the elongated pointed subfalcate wings of the former in contrast with the short rounded wings of the latter. The palpi of *Drucina* are even longer than those of *Pronophila*, the terminal joint is directed forwards (not downwards, as stated by Mr. Butler) and is longer than in the allied genus, the median joint has shorter hair-like scales. In the primaries the middle discocellular nervule is bent close to the origin of the lower radial, where it emits a long strong recurrent nervule; the lower discocellular is bent abruptly nearly to a right angle instead of gradually curved. The antennæ of *Drucina* are longer in proportion than those of either *Pronophila* or *Oxeoschistus*.

1. *Drucina leonata*.

Drucina leonata, Butl. Cist. Ent. i. p. 72¹; Lep. Ex. p. 137, t. 49. f. 5²; Butl. & Druce, P. Z. S. 1874, p. 338³.

♂ alis rufo-fuscis, anticis maculis quinque aut sex submarginalibus albescentibus; posticis fascia lata discali ferrugineo-fulva, maculis duabus subapicalibus coloris ejusdem, interdum in fasciam conflentibus; subtus anticis fuscis, apicibus pallidioribus et punctis tribus notatis, maculis submarginalibus quatuor, una quoque in cellula, altera ultra eam, et tertia apud ramum medianum secundum; posticis griseo-fuscis, fascia lata obscuriore a costa ad marginem internum irregulariter transeunte, ocellisque septem submarginalibus fere obsoletis notatis.

♀ mari similis, sed anticis macula albescente pone cellam et altera ad basin rami mediani secundum, posticis fascia discali latiore et maculis subapicalibus conjunctis.

Hab. COSTA RICA (*Van Patten*^{1 2 3}), Irazu and Rio Sucio (*Rogers*).

This remarkable insect was first sent over from Costa Rica by Van Patten, and was described by Mr. Butler from specimens in the possession of Mr. Druce, into whose hands Van Patten's entire collection passed. Mr. Rogers subsequently found it in the mountains of Irazu, in the same country, and forwarded us several examples in fine condition.

There is little variation between individuals of this species; but in some the primaries have six submarginal spots, in others the apical one is wanting. The rufous subapical spots of the secondaries, too, are sometimes distinct and sometimes joined to the larger patch of the same colour. The latter is the case in all female examples we have examined; but it is not a sexual character. Females, too, have extra spots on the primaries, one just beyond the end of the cell, another on the second median branch.

2. *Drucina championi*, sp. n.

Alis fusco-nigris, anticis acutis et paulo falcatis, maculis quinque aut sex submarginalibus ochraceis notatis, posticis elongatis sensim dentatis et maculis sex submarginalibus pulchre cyaneis ornatis, macula anali minima, duabus proximis maximis; subtus fusco-nigris, anticarum apicibus grisescentibus et fusco variegatis, anticis serie submarginali ocellorum albescentium notatis, posticis grisescentibus fusco irroratis, vena mediana lato nigerrima, maculis duabus costalibus et altera majore a cellulæ fino ad marginem internum, ocellis submarginalibus obsoletis quoque notatis. Exp. cir. 4 poll.

Hab. GUATEMALA, Cerro Zunil (*Champion*).

A recent collection of Mr. Champion's contained several specimens of this beautiful species, which he obtained in the humid forests which clothe the southern slopes of the Cerro de Zunil at an elevation of from 5000 to 6000 feet above the sea.

Its relationship to *Drucina leonata* is evident from the elongated pointed primaries and the general character of the markings beneath. The remarkable blue spots of the secondaries above, however, are in strong contrast with the fulvous patch of those wings in *D. leonata*; and the greater elongation of the secondaries is also very evident. The blue spots recall similar marks on the secondaries of *Antirrhæa philopæmen* and its allies; but with this genus *D. championi* has of course no close affinity.

We gladly avail ourselves of this opportunity of naming this fine species after Mr. Champion, its discoverer, whose successful industry has added vastly to our knowledge of the insect fauna of Guatemala. We hope to figure it in a supplementary Plate.

Subfam. MORPHINÆ*.

MORPHO.

Morpho, Fabricius, Ill. Mag. vi. p. 280 (1807); Westw. Gen. Diurn. Lep. p. 337.

The genus *Morpho* is strictly confined to the warmer parts of the Neotropical Region,

* The position of this group of Butterflies has long been a matter of doubt. Prof. Westwood, in the 'Genera of Diurnal Lepidoptera,' admitted a family Morphidæ, dividing it into two sections. Mr. Bates subsequently did away with the Morphidæ as a family altogether, and placed Prof. Westwood's second section as a subfamily Brassolinæ of the large family Nymphalidæ. This arrangement has been very generally adopted. The genus *Morpho*, however, and its allies he placed with the Nymphalinae, an assignment of them which has not been so favourably received. On the whole, and notwithstanding the cell of the secondary wings being open, we think that these Butterflies have associated characters of sufficient number and value to allow them to stand as a separate subfamily Morphinae, which may be placed next the Satyrinae, and followed by the Brassolinæ—not that any particular alliance is indicated thereby, but solely from the necessity of a linear arrangement. The Morphinae seem to come, in fact, between the Satyrinae and the Nymphalinae. The arguments respecting the position of the genus *Morpho* and its allies are well given by Prof. Westwood in the 'Genera of Diurnal Lepidoptera,' and in a paper "On the Oriental Species related to *Morpho*" (Trans. Ent. Soc. new ser. iv. p. 158 *et seqq.*), and also by Mr. Bates in the 'Journal of Entomology' (ii. p. 177). As we do not propose, in a faunistic work like this, to go at large into questions of classification, we simply refer to these works as giving the most recent discussions of the subject.

and is generally distributed from Southern Mexico in the north to the Argentine Republic in the south, the metropolis of the genus being equatorial South America, especially the eastern slopes of the Andes of Colombia, Ecuador, and Peru. The genus is unrepresented in the West-Indian Islands. As now known it contains about fifty species; but, owing to the variation of many of these, the number would differ considerably according to the views of various entomologists. Within the limits of our region we find eight species, representing all but two of the groups into which *Morpho* may be divided. These two are:—the one containing the largest species of the genus, represented by *M. hecuba*, distinguished by their great size and by the margin of the secondaries being nearly entire, the end of the second median branch alone bearing a large lobe; the second group forms a subsection of that containing *M. cypris*, and is represented by the delicate *M. sulkowskii*, the presence of which in Central America is very doubtful.

The characters of the genus are well given in the 'Genera of Diurnal Lepidoptera;' and as *Morpho* has no allies in the New World, we need not repeat them for the purposes of comparison.

- a. Wings rich brown, either uniform or suffused with grey; primaries pointed; secondaries deeply dentated.

1. *Morpho theseus*.

Morpho theseus, Deyr. Ann. Soc. Ent. Fr. 1860, p. 213¹.

Morpho aquarius, Butl. Cist. Ent. i. p. 74²; Lep. Ex. p. 113, t. 41. f. 1³; Butl. & Druce, P. Z. S. 1874, p. 339⁴.

Alis anticis falcatis, posticis (presortim apud angulum analem) dentatis, supra læte brunneo-fuscis, triente basali argentatis, linea duplici fulva marginatis, serie macularum ejusdem coloris submarginali ornatis, anticis altera quoque interiore notatis; subtus ferrugineo-fuscis, colore dilutiore nubilatis, anticis tribus, posticis quinque ocellis ornatis.

♀ mari similis, sed major et alis pallidioribus distinguenda.

Hab. COSTA RICA (*Van Patten* 2³ 4), Caché (*Rogers*); PANAMA, line of railway (*M^cLeannan*).—COLOMBIA¹, Magdalena and Cauca valleys.

Dr. Van Patten's Costa-Rica specimens were described by Mr. Butler under the name of *Morpho aquarius*; and he subsequently gave a good figure of one of the types in his 'Lepidoptera Exotica,' which, however, represents a male and not a female specimen, as the insects now in our collection prove. Mr. Butler compares his species with *M. theseus*, and strongly expresses his opinion as to its distinctness from that butterfly. With a large series of specimens before us from all the localities mentioned above, we are quite unable to discover any constant characters whereby to distinguish the Colombian and Costa-Rican insects. A certain amount of individual variation exists in all species of this genus; and in this case we do not see that the limits of individual variation have been passed by any one of the series before us. Mr. Butler gives, in his comparison of *M. aquarius* and *M. theseus*, a long list of differences, none

of which is sufficiently constant to enable us to discriminate between the two. Having come to this conclusion, we look upon *M. theseus* as a species of a rather wide range, extending from the upper valleys of the Cauca and Magdalena rivers in Colombia, probably uninterruptedly, through the State of Panama to Costa Rica. Beyond this point we have not yet traced it. In Guatemala and Southern Mexico its place is taken by the next closely allied species, *M. justitiæ*.

2. *Morpho justitiæ*. (Tab. XI. figg. 1, 2.)

Morpho justitiæ, Salv. & Godm. Ann. & Mag. Nat. Hist. ser. 4, ii. p. 149¹.

Morpho theseus, Boisd. Lép. Guat. p. 61².

M. theseo persimilis, sed alarum colore argenteo in mare absente, in femina vix præsentē.

Hab. MEXICO; GUATEMALA, Polochic valley (*Hague*¹).

A rare species in Guatemala, or one difficult of capture, judging from the few single individuals that have reached us at long intervals in the very large collections sent us by Mr. Hague from the valley of the Polochic in Vera Paz. We never met with it ourselves; and it was not until 1867 that Mr. Hague secured the first example.

Our authority for including Mexico within the range of *M. justitiæ* rests on a single female specimen which was formerly in Mr. Druce's collection, and said to be from that country.

The species is very nearly allied to *M. theseus*, but constantly differs in the colour of the upper surface of the wings being rich brown to the base, the hoary grey of this portion of the wings of *M. theseus* being wholly absent in the male, and only faintly shown in the female. The other differences mentioned in our original description are probably of much less importance, and mostly indicate individual differences. Comparing the female of *M. justitiæ* with the male *M. theseus* the differences are not so marked as when individuals of the same sex are placed together. This probably led Boisduval to call a female of the former by the latter name².

On the whole *M. justitiæ* is a fairly defined race, with a habitat distinct from that of *M. theseus*.

Our figure represents one of the Polochic-valley specimens in rather fresher condition than the type, but not otherwise differing from it.

b. Wings white, with a few black marks above and ocelli beneath.

3. *Morpho polyphemus*.

Morpho polyphemus, Westw. & Hew. Gen. Diurn. Lep. p. 339, t. 55. f. 1¹.

Morpho luna, Butl. Cist. Ent. i. p. 4²; Lep. Ex. p. 50, t. 19. f. 2³, p. 113 (note)⁴.

Alis albis semipellucidis, maculis paginæ inferioris supra apparentibus, anticarum apicibus et fascia ad cellulæ finem plus minusve fusciscentibus; posticis lunulis submarginalibus coloris ejusdem ornatis; subtus anticis fascia per cellulæ medium fusca notatis et ocellis duobus (interdum tribus) ornatis, posticis ocellis sex (interdum quinque) notatis.

♀ mari similis, sed major et alarum pagina inferiore sæpe maculis et lineis irregularibus indistincte fuscis notata.

Hab. MEXICO^{1 2 3}, Cuernavaca and Putla (*coll. Oberthür*⁴), Oaxaca (*Fenochio*); GUATEMALA, Chuacus, San Bernardo, Quirigua, below Alotenango, Cerro Zunil, Retalhuleu (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt*); PANAMA.

The nearest ally of *M. polyphemus* is the South-Brazilian *M. laertes*, no representative of this group of the genus being known anywhere in the intermediate region. From *M. laertes* (*M. epistrophis*, Hübn., being probably not specifically distinct) its northern congener differs at first sight in the purity of the white of its colour, the Brazilian insect always having a delicate greenish tint pervading its wings; and there are other differences. Both forms seem liable to a considerable amount of individual variation. The dark apex of the primaries in *M. polyphemus* in some individuals is altogether absent; in others it is a strong feature; the dark mark at the end of the cell varies from an evanescent stripe to a prominent streak; the submarginal row of spots on the secondaries likewise varies from a mere indication to a series of conspicuous marks. None of these variations seems associated with any particular locality. On the under-side great variation exists in the size of the ocelli. In Mexican specimens those of the secondaries are usually smaller than in Guatemalan examples; and in the former that beyond the end of the cell is often absent.

Morpho luna, described by Mr. Butler from a Mexican specimen, which is now in our possession, is a large male example with the markings more than usually developed; but our Mexican specimens gradually lead up from an almost spotless individual to this extreme form, and we consequently do not see how the distinctness of *M. luna* can be maintained. We arrive at this conclusion, notwithstanding Mr. Butler's strongly expressed opinion to the contrary⁴. It may be remarked that Mr. Butler has never told us what the distinctive characters of his species are to distinguish it from *M. polyphemus*; for in the first instance he seems to have compared it with *M. laertes*², which is not really to the point. As to the difference of locality alluded to by him on the authority of M. Oberthür, we do not attach much importance to the statement; Cuernavaca and Putla are places in Mexico at no great distance apart, and are situated on the same side of the mountain chain.

In Guatemala *M. polyphemus* has a very wide range, being found in suitable localities in the forest districts bordering both oceans, and it also extends its range to an elevation of quite 4000 feet above the sea. These butterflies usually fly at a considerable height from the ground amongst the forest-trees; but on one occasion we met with a number of individuals which were flying low through the little village of San Bernado, in the valley of the Motagua river, and we easily captured several specimens.

The flight of *M. polyphemus* is, like that of other Morphos, rather rapid and undulating.

- c. Wings brilliant metallic blue, with a transverse band of white and a submarginal row of white spots.

4. *Morpho cypris*.

Morpho cypris, Westw. Gen. Diurn. Lep. 339¹; Hew. Ex. Butt. iv. *Morpho*, i. f. 2²; Feld. Reise d. Nov., Zool. ii. Lep. p. 456, t. 63. ff. 1-3³; Butl. & Druce, P. Z. S. 1874, p. 339⁴.

Alis nitidissime cyaneis, fascia communi alba a costa anticarum ad marginem internum posticarum ducta, in anticis interrupta, in posticis integra; maculis quoque albis in serie submarginali positis ornatis; subtus fuscis albo marmoratis et anticis ocellis tribus, posticis sex, notatis.

♀ alis fuscis, area interna et maculis submarginalibus læto ochraceis, margine ipso paulo obscuriore; alis subtus iis maris similibus, sed dilutioribus et flavescientioribus.

♀ altera mari similior, pagina alarum superiore cyaneo leviter lavata.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*⁴); PANAMA, Veraguas (*Arcé*), line of railway (*M^cLeannan*).—COLOMBIA^{1 3}.

Though a single male specimen of this species was included in Dr. Van Patten's Costa-Rica collection, Messrs. Butler and Druce believed it to have been obtained in Colombia⁴. It can hardly be doubted, however, that the species does occur in Costa Rica, as we have the excellent testimony of the late Mr. Belt of its presence at Chontales, some distance further north. We also have specimens from the State of Panama, sent us direct from that country; and the late James M^cLeannan informed us that individuals might not unfrequently be seen flying high in the opening of the trees cut for the Panama railway. Owing to the great difficulty of catching them, he only secured a single specimen.

There is some variation in Central-American individuals of this species. Those from Nicaragua seem quite similar to the usual type of the Colombian insect. The specimen from the Panama railway is a small one with rather short primaries, and the white band on the secondaries much narrower. These differences, however, are of no specific value.

We have one female specimen from Nicaragua which is of the yellow type as figured by Hewitson²; but we believe the form with the blue shade also occurs there. This form is well figured by Dr. Felder³.

[*Morpho sulkowskii*, Westw. This species was mentioned in Messrs. Butler and Druce's collection of Costa-Rica butterflies with doubt as to the origin of Dr. Van Patten's single specimen. We have no confirmation of the occurrence of this species within our limits; and though it may possibly be found there, being a Colombian insect, we hesitate to include it formally in our list.]

- d. Wings rich metallic blue; primaries rather falcate, with the apex black.

5. *Morpho amathonte*.

Morpho amathonte, Deyr. Ann. Soc. Ent. Fr. 1860, p. 211¹; Butl. & Druce, P. Z. S. 1874, p. 339².

Morpho menelaus, Boisd. Léop. Guat. p. 61³.

Alis cyaneo nitentibus, anticis valde arcuatis, costa et apice nigris, posticis leviter dentatis; subtus ferrugineo-

fuscis griseo (præsertim ad margines exteriores), griseo marmoratis; anticis tribus, posticis quoque tribus ocellis ornatis.

♀ major marginibus exterioribus late fuscis, anticis maculis sex serie submarginali albis notatis.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²); PANAMA, Chiriqui (*Arcé*), line of railway (*M^cLeannan*).—COLOMBIA¹.

It seems open to question whether this insect is really separable from *M. menelaus* (L.), with which Boisduval seems to have placed it²; but, on the whole, we think we can trace the following differences between them. The primaries of *M. amathonte* are rather longer and more falcate, the costa and outer margins in *M. menelaus* are blacker, and the black of the apex rather more extensive; the abdominal margin is also blacker. The general tint of the blue of the wings is of a rather greener hue in *M. menelaus* and bluer in *M. amathonte*. These differences are slight and unsatisfactory, and point to the disintegration of a species rather than to an established specific difference. There is considerable diversity in the colour and markings of the females of the two race.

M. amathonte does not appear to be common in Central America; for though we have received specimens from various points as far north as Nicaragua, it has never been sent us in any numbers.

e. Wings blue, with a black or brown border, or with a blue band leaving the base of the wings brown.

6. *Morpho granadensis*. (Tab. XI. fig. 3.)

Morpho granadensis, Feld. Reise d. Nov., Zool. ii. Lep. p. 458¹.

Morpho polybaptus, Butl. Ann. & Mag. N. H. ser. 4, xv. p. 338².

Morpho candelarius, Staud. Verh. zool.-bot. Ges. Wien, xxv. p. 101³.

Alis cyaneis, marginibus externis nigris, anticarum apicibus albo sparsim maculatis; subtus fuscis, lineis pallidis subparallelis regulariter marginatis; anticis ocellis tribus permagnis ultra cellulam ornatis, posticis triente basali lineis undulatis griseis bene notata, fere sicut in *M. deidamia*, ocellis quatuor notatis, uno ad costæ medium, reliquis conjunctis apud angulum analem, omnibus fulvo circumcinctis et albo vix pupillatis.

♀ mari similis, sed major et margine nigro paginæ alarum superioris multo latiore.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Gabb*²); PANAMA, Veraguas (*Arcé*), Rio Candelaria (*Ribbe*³).—COLOMBIA¹.

At first sight the appearance of this species on the upperside recalls *M. peleides*; but the very definite marks on the underside seem rather to place it with *M. deidamia* and its near ally *M. neoptolemus*. The most striking feature, as will be seen by reference to the figure, is the size of the ocelli beneath, which far exceed those of either *M. peleides* or *M. deidamia*. These ocelli are nearly uniform black, and have a conspicuous fulvous ring, which is yellower in its allies. The shape of the secondaries is

rather that of *M. peleides*, being more rounded than those of *M. deidamia*. As in *M. deidamia*, the interior of the ocelli is almost wholly black.

M. granadensis was first described by Dr. Felder from a Colombian example sent him by M. Deyrolle, from whom we also have a specimen. We also possess a Veraguan example which does not differ from the type of *M. polybaptus* of Mr. Butler. We have seen two specimens of *M. candelarius* in Dr. Staudinger's collection, and are convinced of the specific identity of them all. Besides these a fine female from Belt's collection shows that the species ranges into Nicaragua.

7. *Morpho peleides*.

Morpho peleides, Kollar, Denkschr. Ak. Wien, math.-nat. Classe, i. p. 356¹; Butler & Druce, P. Z. S. 1874, p. 339².

Morpho montezuma, Guénée, Ann. Soc. Ent. Fr. 1859, p. 373³; Boisd. Lép. Guat. p. 60⁴.

Morpho corydon, Guénée, loc. cit. p. 372⁵ (ex Boisdual, MS.); Boisd. Lép. Guat. p. 60⁶.

Morpho hyacinthus, Butl. Ent. Monthl. Mag. ii. p. 204⁷.

Alis cyaneis, marginibus externis fusco-nigris, maculis submarginalibus albidis (in posticis obsoletis), macula parva costali alba; subtus rufescenti-nigris, lineis tribus pallidis subparallelis marginatis, triente basali obsolete griseo-rufo lineato; anticis ocellis tribus posticis quatuor ornatis, omnibus rosacco pupillatis et puncto albo in medio notatis; margine posticarum rotundato et vix dentato.

♀ mari similis, sed major, margine alarum fusco-nigro multo latiore et anticis linea altera macularum albarum margini externo subparallela distinguenda.

Hab. MEXICO, Cordova (*Sallé*³, *Rümeli*), Valladolid, Yucatan (*Gaumer*); BRITISH HONDURAS, Rio Hondo (*Blancaneaux*), Corosal (*Roe*); GUATEMALA, Yzabal, San Gerónimo, Motagua valley, Choctum and Polochic valley (*F. D. G. & O. S.*), Senahu, Sabo and San Juan (*Champion*); HONDURAS (*Mus. Brit.*⁶); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*²); PANAMA, Calobre (*Arcé*), line of railway (*M^cLeannan*).—COLOMBIA^{1 5}; ECUADOR; VENEZUELA⁵.

It is pretty generally admitted that the separation of the races of *Morpho achilles* (Linn.), of which this is one, is by no means an easy task, owing to the great individual variation exhibited by the insects of different localities and the gradual passage of even the most diverse of these races into one another. The colour-pattern of the underside in these butterflies is almost useless in their classification, so variable is it, and we have to trust almost entirely to the distribution of the blue of the upper surface of the wings for the discrimination of the various races, if such they are.

The true *M. achilles* of Guiana has a blue band, common to both wings, which is so placed as to leave the bases of the wings as well as a broad border black. In *M. peleides* the blue spreads over the whole of the wings, except a narrow black marginal border. It is upon the width and purity of this black border that greatest stress has been laid in dividing the several forms of this species.

The Colombian insect, which is the true *M. peleides* of Kollar, has a comparatively narrow border; but the difference between it and that of Mexican specimens (the true

M. montezuma) is slight, and not sufficiently constant to justify the maintenance of the two species as distinct. In general, too, the wings of the northern specimens are more rounded and the secondaries less pointed than in southern examples. In default of other trustworthy characters we therefore unite these two under Kollar's name, Messrs. Butler and Druce having already used it for Costa-Rica specimens². Its range, from Southern Mexico to Colombia, seems quite continuous; and specimens fairly typical are not wanting wherever it occurs. With these, however, are mingled others whose position is yet open to question. These occur, for the most part, in the State of Panama; and we find at Calobre, mixed with a dark-blue insect with a wide black border (agreeing with the usual Mexican and Guatemalan form), others of a paler more silvery blue, which show distinct spots and lunules on the dark marginal band and an inner row of white spots on the primaries. One specimen from the same locality diverges much more even than these, in being very pale with the blue much as in *M. octavia*, to which the insect bears a close resemblance. Were it not that the base of the wings in all these specimens is blue, we should class them with *M. marinita* rather than with *M. peleides*. They undoubtedly form a link between the two. In the form found on the line of railway the blue of the wings in both sexes is of a peculiarly dark hue, in strong contrast to the light-coloured Calobre *Morpho*.

In Guatemala *M. peleides* is restricted in its range to the eastern or Atlantic side of the main cordillera, where it is common in suitable localities from the sea-level up to an elevation of about 3000 feet. In the forests of the Pacific slope its place is entirely taken by *M. octavia*, a closely allied species, but with an unmistakable tint of the blue of the wings, which renders it not difficult to recognize.

With this exception *M. peleides* is the only *Morpho* of this form in Guatemala, and is fairly constant in its characters in that country. Dr. Boisduval^{4 6} considered that two species inhabited the northern parts of Central America and Mexico, which he calls *M. corydon* and *M. montezuma*—a view that, in our opinion, cannot be supported.

The relationship of *M. peleides* with *M. marinita* is curious; and we believe it quite possible to arrange a series of Costa-Rica specimens which would lead from *M. peleides* to *M. marinita*—*M. hydorina*, Butl., and *M. limpida*, Butl., being intermediate steps.

The following theory suggests itself as a possible explanation of this state of things:—Before the complete formation of the Central-American isthmus, and when, as was most probably the case, islands existed where Costa Rica and the State of Panama now stand, and just prior to their union, a *Morpho* inhabited Costa Rica like *M. marinita*, and another Colombia like *M. peleides*, none at that time being found in Guatemala or Mexico. When the union of the land took place, *M. peleides* was the one to spread, and pushed its way along the isthmus, passed *M. marinita* in Costa Rica, and then occupied the rest of Central America, Yucatan, and Southern Mexico. For some cause or other, those which established themselves in the Pacific coast-region of Guatemala

varied and became *M. octavia*, the rest remaining fairly true to their Colombian ancestors. When *M. peleides* came into contact with *M. marinita* a partial amalgamation took place, giving rise to the intermediate forms we now see. The peculiarities of the Calobre and Panama specimens may be explained on the supposition that some small islands had each a race of *Morpho* allied to *M. peleides*, but that these were swept away by the irruption of *M. peleides* and were absorbed, but not so completely as to obliterate all traces of their existence.

In Guatemala *M. peleides* was a very familiar species to us, as we were in the habit of seeing it almost daily at different places in the department of Vera Paz. Unlike its congeners *M. cypris* and *M. justitiæ* &c., it flies low amongst the scrubby forest, yet is not so easy to catch as would appear at first sight, its undulating buoyant flight making it easily missed with net. Particular specimens seem to have tracts of forest to themselves, round which they fly in nearly the same track every ten minutes or so. Having missed an insect, then, one has only to wait and another chance shortly occurs.

We have described Mexican specimens answering to the true *M. montezuma*.

8. *Morpho octavia*. (Tab. XI. figg. 4, 5.)

Morpho octavia, Bates, Ent. Monthl. Mag. i. p. 163¹; Boisd. Lép. Guat. p. 60².

M. peleidæ similis, sed alis rosaceo læte indutis, alarum marginibus pallide fuscis nec fusco-nigris, et alis omnibus magis pellucidis, ocellis paginæ inferioris supra apparentibus distinguenda.

Hab. GUATEMALA, Pacific coast, San Diego, Retalhuleu (*F. D. G. & O. S.*¹), San Isidro, El Reposo, Paraiso (*Champion*); SALVADOR (*fide Boisduval*²).

As already stated, this race entirely takes the place of *M. peleides* in the low-lying lands of Guatemala which border the Pacific Ocean. Here it is very numerous, being found at various elevations up to between 2000 and 3000 feet above the sea. In its habits it resembles *M. peleides*. According to Boisduval it is also found in the adjoining country of Salvador².

This race does not seem subject to much variation; and the slight difference of the tint of the delicate rosy blue of the wings is due to the age of the specimen rather than to any other cause.

9. *Morpho marinita*.

Morpho marinita, Butl. Cist. Ent. i. p. 75¹; Lep. Ex. p. 113, t. 41. f. 2²; Butl. & Druce, P. Z. S. 1874, p. 339³.

Morpho limpida, Butl. Cist. Ent. i. p. 75⁴.

Morpho hydorina, Butl. Cist. Ent. i. p. 76⁵; Lep. Ex. p. 113 (bis), t. 42. f. 2⁶; Butl. & Druce, P. Z. S. 1874, p. 339⁷.

Alis fusco-brunneis, marginibus externis maculis sagittiformibus serie duplici ornatis; fascia lata interdum ad
BIOL. CENT.-AMER., Rhopal., Vol. I., August 1881. R

anticas restricta, interdum ad angulum posticarum analem extendente, interdum fere alas totas (marginibus exceptis) occupante, cyanca; subtus fere ut in *M. peleide*, anticarum triente apicali grisco magis notato.

Hab. COSTA RICA (*Van Patten* ^{1 4 5}); PANAMA, Chiriqui (*Arcé*).

Owing perhaps to contact with *M. peleides*, this insect is variable in the amount of the blue of the wings. In *M. marinata* the amount is least and is restricted to the primaries; in *M. hydorina* the blue occupies both wings as a broad band, leaving the base of the wings rich brown; between these comes *M. limpida* with the blue of less extent. Mr. Butler, after having divided the specimens in Dr. Van Patten's collection into these three, seems afterwards to have reconsidered the matter and united *M. limpida* as a variety of *M. hydorina*. In our opinion he might have gone further and united all three under *M. marinata*, as we now do. We have examined a very extensive series of this *Morpho*, of which the six-and-twenty specimens in our collection are but a part; and we do not hesitate to say that, if any separation were to be made, nearly every specimen would have to bear a name. To adopt such a course would be absurd; and the only other alternative is to unite them all. Mr. Butler's figures show the extremes of variation as known to him; but we now have specimens from Chiriqui in which the blue encroaches so much on the brown base of the wings as to threaten its absorption, and thus the passage into *P. peleides* seems at least possible.

Subfam. BRASSOLINÆ*.

DYNASTOR.

Dynastor, Westwood, Gen. Diurn. Lep. p. 346 (1851).

Four species are included in this somewhat peculiar genus—the well-known *D. napoleon* and *D. darius*, with which we place *D. macrosiris* and *D. strix*, two species that have hitherto stood under the genus *Brassolis*. We have not been able to make dissections

* We use this name precisely in the sense given it by Mr. Bates (Journ. Ent. ii. p. 176). It includes the genera of Professor Westwood's family Morphidæ which have a prediscoidal cell in the secondary wings and the cell itself closed. So far as we can see, the Central-American genera should be grouped somewhat as follows:—

Dynastor and *Brassolis* have a moderately large prediscoidal cell in the secondaries, and both have an extremely short terminal joint to the palpi; but they may be distinguished by the difference in the form of the club of the antennæ, and other characters.

Opsiphanes is in many respects like *Dynastor*, but has a larger prediscoidal cell and a longer terminal joint to the palpi. The secondary sexual characters of the male also resemble those of *Dynastor*.

Caligo and *Eryphanis* both have a small prediscoidal cell and somewhat similar secondary male sexual characters as distinguished from *Opsiphanes*; but these are recognizable *inter se*.

Narope stands alone in the peculiarity of the male characters; the prediscoidal cell is very large.

There are other South-American genera, which require further examination before the whole can be satisfactorily arranged.

of these last-named insects so as to fully establish their position; but the rounded wings and the gradually clubbed antennæ place them in *Dynastor* rather than in *Brassolis*.

Of these four species, *D. napoleon* is peculiar to Eastern Brazil, *D. darius* has a wide range from Guatemala to Brazil, *D. strix* is peculiar to Central America, and *D. macrosiris* to Guiana.

D. darius, which must be taken as the type of *Dynastor*, has the body short, the antennæ gradually clubbed; the prediscoidal cell of the secondaries is moderately large; the wings are rounded, the terminal joint of the palpi very short. The tegumen of the male has a pair of strong points on the ventral surface directed outwards, much as in *Opsiphanes*; the harpagones have their proximal ends very broad, the ends are rounded and dentate towards the end of the dorsal edge. There are no distinct pencils of hair on the secondaries.

1. *Dynastor darius*.

Papilio darius, Fabr. Syst. Ent. p. 482¹.

Dynastor darius, Butl. Cat. Fabr. Lep. p. 40².

Papilio anaxarete, Cram. Pap. Ex. i. t. 95 A, B³.

Potamis superba, Hübn. Samml. ex. Schmett. i. t. 72⁴.

Dynastor stygianus, Butl. Cist. Ent. i. p. 73⁵; Lep. Exot. p. 125, t. 47. f. 1⁶; Butl. & Druce, P. Z. S. 1874, p. 339⁷.

Alis fuscis, anticis fascia ultra cellulam, maculis tribus infra eam, duabus minoribus ad apicem, albidis; posticis macula apicem versus albicante, linea undulata ab ea extendente grisea, margine externo albicante, subtus ochraceis ferrugineo piperatis, dimidio posteriore anticarum fusco, maculis albidis marginem anteriorem versus notato.

Hab. GUATEMALA, Chuacus (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*^{5 6 7}); PANAMA, Veraguas (*Arcé*).—COLOMBIA; ECUADOR; BOLIVIA; LOWER AMAZONS; SOUTH BRAZIL¹.

This is a widely ranging species, extending from Guatemala to Rio. Mr. Butler describes a female from Costa Rica under the name of *D. stygianus*, and says it "seems quite distinct from *D. darius*"⁶. Mr. Butler also speaks of *D. stygianus* being twice the size of *D. darius*; from this it would appear that he compared a female of the former with a male of the latter. We have carefully compared the type specimen of *D. stygianus* with females of *D. darius* from South America, and find no difference in size. The white spots are somewhat larger; but from the series before us this appears to be a rather variable character; we are therefore unable to admit *D. stygianus* as a distinct species. *D. darius* has no very close ally with which we are acquainted.

2. *Dynastor strix*. (*Brassolis strix*, Tab. XII. figg. 3, 4.)

Brassolis strix, Bates, Ent. Monthl. Mag. i. p. 164¹.

Alis fuscis, ad basin pallidioribus, fascia transversa ultra cellulam et macula infra eandem, maculisque minoribus

duabus apud apicem albis, posticis albo marginatis; subtus anticis nigrescentibus dimidio basali lineis griseis transeuntibus, fascia albescente fero ut in pagina superiore et ultra eam ocello duplici nigro, fulvo circumcincto, posticis cinnamoneis strigulis variis nigris, marginem interiorem versus dilutioribus.

Hab. MEXICO, Cordova (*Höge*); GUATEMALA, Chuacus¹, Cerro de Zunil (*F. D. G. & O. S.*).

Described first by Mr. Bates from specimens found by us at Chuacus, in Guatemala, in 1861. Salvin afterwards procured a single specimen at the hacienda of Las Nubes, on the slope of the Cerro de Zunil; and we have recently received another example taken by Mr. Höge in Mexico. All these are females. It appears to be a rare species, as in all the collections we have received no other specimens have occurred. Its nearest ally is *B. macrosiris* of Guiana, of which there is a figure in 'The Genera of Diurnal Lepidoptera;' and of this species there is an example in the British Museum which strongly resembles *D. strix*, especially in the marking of the underside. *B. strix*, however, differs from this at first sight in having a conspicuous white band crossing the end of the cell of the anterior wings towards the anal angle.

The gradually clubbed antennæ and the rounded wings of this species indicate that its position is in this genus rather than in *Brassolis*, where Mr. Bates originally placed it. The markings of the underside, however, are different from those of *D. darius*, being much more strongly shown and in more vivid colours. Indeed, in this last respect hardly any butterfly that we know of shows so beautiful and harmonious a combination of colours.

A specimen from Chuacus is figured.

BRASSOLIS.

Brassolis, Fabricius, Ill. Mag. vi. p. 282 (1807), partim; Westwood, Gen. Diurn. Lep. p. 350.

This genus, as restricted by Prof. Westwood, contains three closely allied species, one of which (*B. isthmia*) is peculiar to Central America, a second (*B. sophoræ*) to Guiana and the basin of the Amazons, and the third (*B. astyra*) to Eastern Brazil. A fourth species (*B. macrosiris*) included in the genus by Prof. Westwood, should, in our opinion, be removed to *Dynastor*.

Like *Dynastor* the terminal joint of the palpi is very short, and the prediscoidal cell of the primaries is moderately large; but the primary wings are much more pointed, and the antennæ abruptly clubbed. The costal margin, too, near the base is concave, especially in the male. The tegumen of the male is a simple hook without lateral lobes on the ventral surface. The harpagones are also simple, short, and stout, with a slight serration near the tip of the dorsal edge. There are no pencils of hairs on the secondaries.

1. *Brassolis isthmia*. (Tab. XII. figg. 5, 6 ♂; 7, 8 ♀.)

Brassolis isthmia, Bates, Ent. Monthl. Mag. i. p. 164¹.

♂. Alis fuscis, anticis fascia transversa lata a costa per cellulæ finem ad angulum analem eunte, fulva et apud cellulæ finem macula fusca notata, posticis linea angusta ramo mediano primo attingente fulva; subtus alis dilutioribus et albido irroratis, fascia fulva anticarum paginæ superioris costam versus interrupta, linea duplici submarginali nigra et ocello nigro apud apicem ornatis; posticis ocellis tribus notatis, uno ad costæ medium altero ultra cellulam, altero ad angulum analem, et maculis duabus fulvis ad basin ornatis.

♀ mari similis, sed major, et posticis omnino fuscis distinguenda.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Lion-Hill Station (*M'Leannan*¹), Flamenco Island (*O. S.*).

Our first specimens of this insect were two males captured by M'Leannan on the Panama railway. These were recognized by Mr. Bates, into whose hands they passed, as distinct from *B. sophoræ*, and described by him¹. Since then Salvin obtained a female, which he caught one evening in April 1873 on board ship when lying off Flamenco Island in the Bay of Panama; and we have received other examples from the State of Panama. A pair were also taken by Mr. Belt in Nicaragua, which agree fairly with the Panama insect; the male, however, wants the tawny streak of the secondaries. *B. isthmia* differs from *B. sophoræ* in the absence of the tawny markings of the secondaries; the males, however, have a fine linear tawny streak on the side of the first median branch; but this is absent in the females. The third species of the genus, *B. astyra*, which is from Brazil, is also closely allied. This, though it wants the tawny markings of *B. sophoræ*, may readily be distinguished from both the northern forms by being of a much darker brown colour.

The male specimen figured came from Lion Hill, and the female from Flamenco Island.

OPSIPHANES.

Opsiphanes, Doubleday, Gen. Diurn. Lep. p. 344 (1851).

This genus as at present constituted contains some twenty species, which are spread over the whole of Tropical America from Mexico to Southern Brazil. These are divisible into several groups, and it is very probable that at some future time it will be found advisable to split up the genus into several minor ones.

In Mexico and Central America eight species have hitherto been found, representing most of the groups into which the genus seems divisible. The section, however, represented by *Opsiphanes syme* has not yet been discovered anywhere but in South-eastern Brazil; and there is no species exactly answering to *O. xanthus* of Guiana.

The chief characters by which *Opsiphanes* may be known are, taken together:—the large size of the prediscoidal cell of the secondaries; a denuded patch on the submedian nervure of the secondaries in the male with or without a central pencil of hair, as in *Caligo*; the coxa of the front legs of the male is short and stout, and shorter than the

femur. The tegumen of the male has a pair of hooks on the ventral edge directed forwards much as in *Dynastor*; the harpagones are simple, without lobes, but have a pair of dentate processes at the extremity of the dorsal edge. The pencils of hair on the secondaries vary in different sections, which admit of precise definition.

a. Body stout; secondary wings of male without any pencils of hair.

1. *Opsiphanes josephus*, sp. n. (Tab. XIII. figg. 3, 4.)

Alis fuscis, anticis falcatis, fascia profunde serrata ultra cellulam a costa ad angulum analem fulva, punctis ad apicem albis; posticis macula subtriangulari intra ramos medianos primum et secundum nigra; subtus alis lividis obscure marmoratis, anticis fascia paginae superioris leviter notatis, lineis tribus aut quatuor undulatis cellulam transeuntibus, ocello apud apicem, posticis duobus ocellis pallidioribus, uno ad marginem anteriorem, altero angulum analem versus ornatis.

Hab. GUATEMALA, San José de Guatemala (*O. S.*).

This curious species is unlike any other in our collection; but in having slightly falcate wings and in the absence of any pencils of hair on the secondaries it agrees with *Opsiphanes cassiope* of Guiana and the Lower Amazons. We have therefore placed it in the same group of the genus as that species. The peculiar triangular patch of black felted scales on the secondaries at once distinguishes it from *O. cassiope*.

The only specimen that has hitherto come under our notice was caught by Salvin at the port of San José de Guatemala the evening before he left the country in March 1874, when, every thing being packed up, it was consigned to an envelope and placed with letters, where it remained for several weeks. The condition, therefore, of this specimen is not good, the body being much flattened and the wings rubbed. This specimen, a male, we have figured.

b. Body stout; a pencil of hair in the cell of the secondaries near the origin of the first median branch; no pencil on the costal side of the submedian.

2. *Opsiphanes boisduvali*.

Opsiphanes boisduvalii, Westw. & Hew. Gen. Diurn. Lep. p. 345, t. 57. f. 1¹.

Caligo boisduvali, Boisd. Léop. Guat. p. 55².

Alis obscure croceis, apice margineque anticarum externo fusciscentibus, macula apud apicem fusca; subtus dilutioribus, lineis minutis transversis obscurioribus irroratis, in cellula anticarum latioribus, anticis ocello apud apicem, posticis duobus, uno ad marginem costalem altero angulum analem versus.

Hab. MEXICO¹, Jalapa (*Höge*); GUATEMALA, San Gerónimo (*F. D. G. & O. S.*), Polochic valley (*Hague*); HONDURAS (fide *Boisduval*²).

This very distinct species was named and figured in the 'Genera of Diurnal Lepidoptera' from a Mexican specimen, whence we have also received examples. In Guatemala we found it at San Gerónimo, on the plain of Salama, and examples were

afterwards procured by one of Mr. Hague's collectors in the Polochic valley, and forwarded to us. We have no knowledge of the extension of this species further south, beyond the doubtful reference to its occurrence in Honduras given by Boisduval². It appears to be a scarce insect, being, like other members of the genus, of crepuscular habits, and very rapid, powerful flight.

3. *Opsiphanes cassiæ*.

Papilio cassiæ, Linn. Mus. Ulr. p. 265¹; Cram. Pap. Ex. t. 106. f. A².

Opsiphanes cassiæ, Butl. Cat. Fabr. Lep. p. 41³.

Caligo fabricii, Boisd. Léop. Guat. p. 54⁴.

Alis fuscis, anticis fascia transversa a costa ad angulum analem ducta (costam versus bifida) ferrugineo-ochracea; posticis fascia submarginali coloris ejusdem; subtus fuscis griseo marmoratis, litura a cellula ad angulum analem fusca, figuris ad basin nigris, anticis uno, posticis ocellis duobus ornatis.

Hab. MEXICO, Valladolid, Yucatan (*Gaumer*); GUATEMALA, Polochic valley (*Hague*), central valleys and Retalhuleu (*F. D. G. & O. S.*); HONDURAS (*Mus. Brit.*); NICARAGUA, Chontales; COSTA RICA, Cache (*Rogers*); PANAMA, Chiriqui (*Arcé*).—COLOMBIA; ECUADOR; PERU; GUIANA²; BRAZIL.

This name of Linnæus evidently refers to this insect, as he specially calls attention to the fulvous band of the primaries bifurcating near the costa, whereas in *O. inviræ* this band is simple. Evidence is not wanting, however, pointing to the probable identity of these so-called species; for the band of the primaries is not only of very variable width, but also a transition can, to a certain extent, be traced between the simple straight band and the bifurcated one, and this without any reference to locality.

In our region *O. cassiæ* is decidedly the most abundant form; indeed, with the single exception of a Costa-Rica example, *O. inviræ* is not represented at all.

4. *Opsiphanes inviræ*.

Potamis superba inviræ, Hübn. Samml. ex. Schm. i. t. 76¹.

Brassolis inviræ, Hübn. Samml. ex. Schm. ii. t. 66².

Opsiphanes cassiæ, Butl. & Druce, P. Z. S. 1874, p. 339³ (nec Linn.).

O. cassiæ persimilis, sed fascia anticarum fere recta nec bifida forsan distinguendus.

Hab. COSTA RICA (*Van Patten*³).—COLOMBIA; VENEZUELA; PERU; AMAZONS; BRAZIL; PARAGUAY.

The chief, if not the only character by which this species is distinguished, is in the band of the primaries being simple, and not bifid towards the costa. Our Costa-Rica example, though referred to *O. cassiæ* by Messrs. Butler and Druce, seems clearly to belong here. Compared with *O. cassiæ*, *O. inviræ* has in our region a much less extensive range, and only enters Central America as far as Costa Rica, whence we have a single specimen.

5. *Opsiphanes tamarindi*. (Tab. XIII. figg. 5, 6.)

Opsiphanes tamarindi, Feld. Wien. ent. Monat. v. p. 111¹ (ex Boisd. MS.).

Caligo tamarindi, Boisd. Léop. Guat. p. 54².

Opsiphanes glycerie, Butl. Cat. Fabr. Lep. p. 41³ (partim); Dist. Proc. Ent. Soc. 1876, p. xiii⁴ (nec Fabr.).

Alis obscure fuscis, anticis fascia transversa ultra cellulam albida, punctis ad apicem albis; posticis aliquot rubescentibus; subtus alis brunneis griseo irroratis et ad basin lineis nigris notatis, anticis ocello unico, posticis duobus, uno ad marginem costalem, altero angulum analem versus, notatis.

♀ mari similis, sed major, posticis rufescentioribus et fascia albida anticarum supra et subtus latiore distinguenda.

Hab. MEXICO (*Sallé*¹), Volcan de Orizaba (*Sallé*³), Cordova (*Rümeli*); GUATEMALA, Retalhuleu and Motagua valley (*F. D. G. & O. S.*), San Gerónimo and Polochic valley (*Hague*); COSTA RICA (*Van Patten, Carmiol*), Talamanca (*Gabb*³); PANAMA, Veraguas (*Arcé*), Lion Hill (*McLeannan*).—COLOMBIA¹; VENEZUELA¹.

This species was first recognized by Dr. Felder, who described certain Venezuelan, Colombian, and Mexican specimens under this name. We possess a large series of examples from Central America which exhibit no tangible differences. The nearest ally to *O. tamarindi* is *O. crameri*, Feld., a name which is probably synonymous with *O. glycerie* (Fabr.). From this insect *O. tamarindi* differs in having the secondaries usually more rufescent, especially in the female, and the transverse band of the primaries yellowish white instead of tawny. This band varies considerably: in one Colombian male in our collection it is but faintly indicated; in others it is broad,—and this without any apparent reference to locality.

As already remarked, *O. glycerie* of Fabricius is probably the same as *O. crameri* of Felder; but the Mexican specimen referred by Mr. Butler to *O. glycerie* in his catalogue of Fabrician Diurnal Lepidoptera no doubt belongs to *O. tamarindi*³. One of the older specimens he mentions under *O. glycerie* appears to be correctly named.

A specimen from the Polochic valley is figured.

6. *Opsiphanes quirinus*, sp. n.

Alis nigricanti-brunneis, anticarum dimidio basali et posticis (margine excepto) læte rufescentibus, margine externo posticarum valde sinuato sicut in *O. quiteria*; anticis fascia transversa ochracea et punctis albis apicalibus fere ut in *O. inviræ*; subtus alis brunneis nigro valde distincte irroratis, ocellis ut in speciebus hujus generis.

♀ mari similis, sed multo major et fascia anticarum alba nec ochracea distinguenda.

Hab. GUATEMALA, Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*); PANAMA, Chiriqui and Calobre (*Arcé*).

This is a race of *O. quiteria* of Guiana, the Amazons valley, and Northern Brazil, having the same deeply indentated margin to the secondaries; it differs, however, in

having the base of the primaries and the whole of the secondaries, except the outer margin, deep rufous; the female, too, has a white instead of a fulvous band.

O. quirinus appears to be more abundant in the southern part of Central America than in Guatemala, whence we have received only a single specimen.

7. *Opsiphanes amphirhoe*.

Brassolis amphirhoe, Hübn. Samml. ex. Schm. ii. t. 67¹.

Alis nigricanti-fuscis, anticis fascia arcuata fulva a costa ad angulum analem interdum integra interdum interrupta, maculis tribus albis apud angulum apicalem; posticis valde elongatis et margine apud angulum apicalem fulvo notato; subtus fere ut in aliis speciebus hujus generis, sed maculis omnibus bene definitis.

Hab. GUATEMALA, Mirandilla (*Champion*).—S.E. BRAZIL.

A single example of this *Opsiphanes* sent us by Mr. Champion agrees accurately with South-Brazilian specimens. The appearance of this Brazilian species in Central America is a singular fact—the more so, seeing that it has never been noticed in the intermediate region.

Some confusion has prevailed respecting this species, the name *O. amphirhoe* having been placed as a synonym of *O. xanthus* (Linn.); but with that insect, as we have already shown, it has no near relationship. It agrees in structure with the more typical members of the genus, *O. xanthus* with its allies forming a somewhat abnormal section.

c. Body comparatively slender; pencil of hair on the secondaries as in Section b.

8. *Opsiphanes orgetorix*.

Opsiphanes orgetorix, Hew. Ent. Monthl. Mag. vi. p. 177¹; Ex. Butt., *Opsiphanes*, t. 1. ff. 1, 2².

Alis obscure brunneis; anticis falcatis, fascia arcuata a costa ad angulum analem fulva, maculis tribus apicalibus albis; posticarum margine externo fulvo; subtus alis brunneis, brunneo et albo irroratis, fascia communi obscura per ocellos posticarum ad costam anticarum mediam extensa, anticarum margine externo gilvo lineis duabus valde sinuatis notato, anticis ocello unico ad apicem, posticis duobus magnis, uno mediam costam attingente, altero ad angulum analem ornatis.

♀ mari similis, sed fascia anticarum multo rectiore et violaceo tineta, margine quoque posticarum fulvo multo latiore distinguenda.

Hab. NICARAGUA, Chontales (*Belt*^{1 2}); PANAMA, Chiriqui and Veraguas (*Arcé*).

This beautiful species was discovered by the late Mr. Thomas Belt at Chontales in Nicaragua; and his specimens were described by Hewitson¹, and the female figured in 'Exotic Butterflies'². Since then several specimens have been sent from Chiriqui and elsewhere in the State of Panama; but we have no tidings of it from Costa Rica, though doubtless it also occurs there.

In the rounded form of the secondary wings and in the more slender body this species resembles *O. xanthus*, Linn., and its allies, rather than the stout-bodied species which we have placed before it; but the arrangement of the pencils of hair on the secondaries

is just as in *O. tamarindi* and in all the other Central-American *Opsiphanes*, except *O. xanthicles* described below. Though the male resembles that of *O. xanthus* in many respects, the female is quite different; so that *O. orgetoria* has no near ally that we know of.

d. Body slender; secondaries rounded; no pencil of hair in the cell of the secondaries near the origin of the first median branch, but a pencil in front of the pre-discoidal cell.

9. ***Opsiphanes xanthicles***, sp. n. (*Opsiphanes xanthus*, Tab. XII. figg. 1, 2.)

Alis fuscis, anticis fascia arcuata a costa ad angulum analem fulva, maculis apicalibus albis; posticis unicoloribus, maculis obsoletis fulvis apud angulum apicalem; subtus obscure brunneis albo (nisi anticarum dimidio basali lineis nigris notato, et fascia posticarum transversa) irroratis, ocello distincto apud anticarum apicem et duobus parvis (uno costam posticarum attingente, altero ad angulum analem) notatis. ♀ adhuc ignota.

Hab. PANAMA, Chiriqui and Veraguas (*Arcé*).—UPPER AMAZONS.

This species has a very close general resemblance to *O. xanthus*, so much so that for some time we considered that it ought to bear that name. Having now obtained a specimen of the true *O. xanthus* from British Guiana, agreeing well with the figure in Clerk's 'Icones Insectorum,' the basis of Linnaeus's description, we are able to detect important differences in the present species.

The true *O. xanthus* has a pencil of hairs in the cell, just as in most *Opsiphanes*, whereas in *O. xanthicles* this pencil is wholly absent. The long patch of transverse hair so prominent in *O. xanthus* is here much reduced. These differences (and there are others) at once serve to distinguish the two species. Indeed *O. xanthicles*, so far as we know at present, stands alone in not having the pencil of hairs in the cell near the origin of the first median branch.

Besides our Central-American examples we have others from the Upper Amazons, one taken by Mr. Bates at Ega, and another by Hauxwell at Pebas; so that *O. xanthicles* enjoys a wide range.

We have figured one of the Panama specimens.

CALIGO.

Caligo, Hübner, Verz. bek. Schmett. p. 51 (1816); Westw. Gen. Diurn. Lep. p. 340.

This genus contains the largest Butterflies of the South-American fauna. Excluding the members of the next genus (*Eryphanis*), some twenty species are now known, of which seven are found in Central America. Of these only one, *C. uranus*, can claim to be peculiar to the region. The rest are all found in South America, some of them (such as *C. eurylochus* and *C. ilioneus*) having an exceedingly wide range. Southern Mexico is the northern limit of the genus, where three species (*C. uranus*, *C. oileus*, and *C. memnon*)

occur. In addition to the two sections of the genus represented in our fauna there is another, with densely hairy eyes, found in South America, which has not yet been detected within our border; this is represented by the Brazilian *C. martia*, and on our frontier by the Colombian *C. oberthüri*. As will be seen below, the two sections of *Caligo* with smooth eyes, of which alone we have to treat here, have fairly good characters by which to distinguish them.

Caligo has large rounded wings and a robust body; the prediscoidal cell of the secondaries is quite small; there is in the male a denuded patch on the submedian nervure of the secondaries, with a small pencil of hairs in the middle on the inside of the nervure; the femur of the front legs of the male is about equal in length to the coxa, which is stout. The tegumen of the male has a lobe in the middle of the ventral edge on each side; the ventral edge of this is nearly straight and serrate, and at its proximal end bears a long spur directed outwards; the harpagones are long and slender, strongly dentate on their upper edge, which is either a simple curve or bears a lobe strongly dentate in front.

A. Secondary wings without fulvous buff; secondary sexual organs of the male with the dorsal edge of the harpagones simply dentate.

a. Base of primaries bluish fuscous, margin not very distinctly darker.

1. *Caligo eurylochus*.

Papilo eurilochus, Cr. Pap. Ex. t. 33. f. A, t. 34. f. A¹.

Caligo eurylochus, Butl. & Druce, P. Z. S. 1874, p. 339².

Pavonia eurylochus, Boisd. Léop. Guat. p. 56³.

Pavonia eurylochus, var. *brasiliensis*, Feld. Verh. z.-b. Ges. Wien, xii. p. 476⁴.

Caligo galba, Deyr. Rev. Zool. 1874, tt. 6, 7⁵.

Alis fuscis, marginibus late obscure nigricantibus; dimidio primariorum basali cæruleo vix tineto; posticarum parte basali viridescente ad marginem externum obscurum purpurascentiore; subtus omnino marmoratis, anticis ad apicem ocello unico, posticis tribus ornatis, horum uno ad costæ medium, altero maximo ultra cellulam super ramos medianos, altero inconspicuo ultra cellulam positus; inter duos maximos lineis paucis nigris, sed coloribus irroratis, haud interruptis.

♀ mari similis, sed major et primariis fasciis duabus submarginalibus obscure fulvis distinguenda.

Hab. GUATEMALA³, Motagua valley (*F. D. G. & O. S.*), San Juan (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²); PANAMA, Volcan de Chiriqui and Veraguas (*Arcé*).—COLOMBIA; GUIANA¹; BRAZIL⁴.

We have some hesitation in placing Central-American specimens of this *Caligo* under the name of *C. eurylochus*; for, comparing our series with Guianan, Amazonian, and Brazilian specimens, we find that the outer margin of the primaries is usually darker than in the typical form, and the mottling of the undersurface is less evenly distributed, especially on the primaries; the secondaries, too, have a whiter ground near the base of the wing. These differences, however, are not quite constant enough to be available as

specific characters; we therefore prefer to use the name *C. eurylochus* for our specimens, including those from South Brazil, which Dr. Felder proposed to call *Pavonia brasiliensis*⁴. Should the Central-American insects ultimately prove to be distinct, M. Deyrolle's title *C. galba* may be applied to them. This name was attached to two plates, representing the upper and underside, which were published in the 'Revue de Zoologie' for 1874, but unaccompanied by any letterpress. We have, however, a specimen from M. Deyrolle marked as the type of *C. galba*, and with the locality "Colombie" attached to it. This specimen presents no material differences from our Central-American ones.

C. eurylochus appears to be a rare insect in Guatemala, as the only specimens we possess from that country are one taken by ourselves, in the year 1861, in the valley of the Motagua, and another recently sent to us from San Juan, in the Polochic valley, by Mr. Champion. We have never seen it in the vast collections sent us from Vera Paz and elsewhere. In Nicaragua and thence to South America it is much more abundant.

2. *Caligo oileus*.

Pavonia oileus, Feld. Wien. ent. Monatschr. v. p. 111¹; Reise d. Nov. Lep. p. 454, t. 65. f. 2²;

Bates, P. Z. S. 1863, p. 248³.

Caligo oileus, Butl. & Druce, P. Z. S. 1874, p. 338⁴.

Pavonia scamander, Boisd. Léop. Guat. p. 57⁵.

C. eurylocho affinis, sed minor et area inter ocellos maximos paginae posticarum inferioris omnino brunnea, lineis nigris valde sinuatis notata, distinguendus.

Hab. MEXICO, Cordova (*Rümeli*); GUATEMALA, Yzabal (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*⁴); PANAMA, Lion-Hill Station (*M. Leannan*³). —COLOMBIA¹; VENEZUELA¹; ECUADOR.

This species seems most nearly allied to *C. eurylochus*, but is usually a much smaller insect. The mottling of the undersurface is not so uniformly distributed, and is altogether interrupted between the costal and the largest ocelli of the secondaries. This part of the wing is rich brown, with strong black very sinuated lines. The character is well shown in Dr. Felder's plate². *C. oileus* was originally described from Venezuelan and Colombian specimens¹. We now trace it through Central America as far north as Mexico (whence we have a single specimen) and Guatemala, where we obtained a male in the forest near Yzabal in September 1861. It must be rare in Mexico and Guatemala, as no other specimens have come to us from there. Nor does it seem much more common elsewhere, as the three Panama specimens mentioned by Mr. Bates in his paper on Butterflies of that district³ are the most we have from any one place. Its home seems to be the northern parts of Colombia.

b. Base of primaries blue, submarginal parallel bands very distinct.

3. *Caligo ilioneus*.

Papilio ilioneus, Cr. Pap. Ex. t. 52. f. A¹.

Pavonia ilioneus, Bates, P. Z. S. 1873, p. 249²; Boisd. Léop. Guat. p. 56³.

Potamis conspicua teucer, Hübn. Samml. ex. Schmett. i. t. 77⁴.

Alis cærulee indutis, marginibus externis late nigricantibus; posticis paulo purpurascensioribus; anticis lineis duabus fulvis subparallelis et maculis nigris albo intus punctatis apud angulum analem notatis; subtus ochraceis, fusco irregulariter marmoratis et lineis pallidis et obscuris notatis; ocellis ut in præcedentibus specibus.

♀ mari valde similis, sed major et paulo minus cæruleo lavata.

Hab. PANAMA, Lion-Hill Station (*M'Leannan*²).—COLOMBIA; ECUADOR; AMAZONS; TRINIDAD; GUIANA¹; BRAZIL; PARAGUAY.

This widely spread species may readily be known by the blue of the basal part of the primaries and by the two distinct submarginal fulvous bands of the same wings. These are well represented in Cramer's figure¹, which is otherwise rather exaggerated, a much more accurate representation of it being given by Hübner⁴.

C. ilioneus only just comes into our fauna at Panama, where M'Leannan captured a few specimens². Dr. Boisdual states that it occurs in Guatemala³; but this assertion requires confirmation.

c. Blue of upper surface restricted to secondary wings; central area of primaries much paler than the margin.

4. *Caligo memnon*. (Tab. XIV. figg. 1, 4.)

Pavonia memnon, Feld. Reise d. Nov. Lep. p. 454¹.

Caligo memnon, Butl. & Druce, P. Z. S. 1874, p. 339².

Alis fuscis, marginibus late nigricantibus; anticis medialiter et linea submarginali griseo-ochraceis; posticis dimidio basali purpurascens-cyaneo; subtus fere ut in *C. ilioneo*, area anticarum mediana ochrascente maculis et lineis obscuris obsoletioribus.

Hab. MEXICO (*Sallé*¹), Cordova (*Rümeli*), Oaxaca (*Fenochio*), Valladolid, Yucatan (*Gaumer*); GUATEMALA, Yzabal, Polochic valley, San Gerónimo, Motagua valley, and Retalhuleu (*F. D. G. & O. S.*), Telemán, San Isidro, and Pantaleón (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²); PANAMA, Volcan de Chiriqui and Veraguas (*Arcé*).—VENEZUELA.

In his description of this species Dr. Felder very properly compares it with *C. teucer*, with which it is very closely allied, the chief, if not the only trustworthy, point of difference being the greater extent of the greyish-buff patch on the primaries and the more indistinct marks on the central portion of the primaries beneath—not very salient characters.

How far it can be distinguished from *C. taramela* (Godt.), of Brazil, we are unable

to say, as we have no authentic specimens from that country with which to compare it. It appears, however, very closely to resemble that species.

Dr. Felder's types came from Mexico and the Pacific side of Guatemala, the latter having been supplied him by us¹. From both these countries we have seen a very large number of specimens, it being the only *Caligo* of this section found in Mexico, and quite the commonest of its genus in Guatemala. Thence it spreads over the rest of Central America to the State of Panama, and into Venezuela, whence we have a specimen which agrees with *C. memnon* rather than with *C. teucer*, though the marking of the primaries beneath is stronger than is usual with the former species.

The resort of *C. memnon* is the forests of moderate elevation down to the sea-level; and it is also found in scrubby forest as high as 3000 feet above the sea.

When disturbed it takes short flights through the underwood a few feet from the ground, settling on the stem of a tree with closed wings, where it is very difficult to see, unless marked to the spot where it alights.

A male from San Gerónimo, Guatemala, is figured.

5. *Caligo telamonius*. (Tab. XIV. figg. 2, 3.)

Pavonia telamonius, Feld. Wien. ent. Monatsehr. vi. p. 422¹; Reise d. Nov. Lep. p. 454, t. 64. f. 1²; Boisd. Léop. Guat. p. 57³.

C. memnoni persimilis, sed antearum basi magis fulvescente et linea submarginali ochracea in mari minus distincta, posticis quoque in certa luce multo magis purpuraseentibus, hoc colore ad marginem extendente, distinguendus.

Hab. PANAMA, Volcan de Chiriqui and Calobre (*Arcé*), Lion-Hill Station (*M. Leannan*).
—COLOMBIA¹.

Boisduval gives Nicaragua as a locality for this species³, a statement we cannot as yet support, as we have no tidings of it in that direction beyond Chiriqui, in the State of Panama. It was originally described from Colombian examples¹, whence we have specimens from the neighbourhood of Santa Marta. Northern Colombia must be considered its head quarters, whence it passes into the narrowest part of the Isthmus of Panama.

As a species *C. telamonius* is quite distinct, though it has a great general resemblance to *C. memnon*. The more ochraceous primaries, and especially the extent of the blue of the secondaries, render it not difficult to distinguish.

A male from Calobre, Panama, is figured.

[Boisduval (Léop. Guat. p. 56) has described another species of this group, from Honduras and Guatemala, under the name of *Pavonia dardanus*. We have specimens from Mons. Deyrolle, from Colombia, thus designated; but from them it appears that this name is only a synonym of *C. prometheus* (Koll.), a Colombian insect. As we have no other tidings of it in our region, we await specimens from a more trustworthy source before inserting it as a member of our fauna.]

- B. Secondary wings with conspicuous orange or fulvous-buff margin; secondary sexual organs of the male with the harpagones bearing a distinct posteriorly dentate lobe on the middle of the dorsal edge.

6. *Caligo atreus*.

Morpho atreus, Kollar, Denkschr. Ak. Wien, Math. Cl. i. p. 356, t. 44. ff. 1, 2¹.

Caligo ajax, Doubl. & Hew. Gen. Diurn. Lep. p. 342, t. 56. f. 2².

Pavonia ajax, Bates, P. Z. S. 1863, p. 248³; Boisd. Léop. Guat. p. 57⁴.

Alis brunneo-fuscis, anticis fascia albida a costa per cellulæ finem ad angulum analem eunte, et in hac regione purpureo suffusis; posticis fascia lata in linea eadem aurantiaca, angulum apicalem ipsum haud occupante; subtus brunneis, anticarum cellula nigro distincte figurata, posticarum parte basali nigro irrorata, fascia ultra cellulam anticarum albicante, posticis litura lata sicut supra fulva, lineis obscuris in medio divisa; ocellis ut solet in hoc genere.

♀ mari similis, sed major.

Hab. NICARAGUA⁴, Chontales (*Belt*); PANAMA, Volcan de Chiriqui, 2–3000 feet (*Champion, Arcé*), Lion-Hill station (*M^r Leannan*³).—COLOMBIA¹; W. ECUADOR²; VENEZUELA².

This magnificent species was first described by Kollar from specimens obtained by Sulkowski in Colombia¹; and a figure of a female accompanies his paper. Our Colombian specimens are all males, and were obtained by the late T. K. Salmon at Frontino, in the State of Antioquia. These do not materially differ from Kollar's figure, except that the orange band of the secondaries is in some cases narrower, with a tendency to break up into spots, and in some paler in colour. The species also occurs in Venezuela², specimens from which country were named *C. ajax* by Doubleday, and whence we also have examples. These differ slightly from the Colombian ones in having the orange band of the secondaries broad and deeply coloured, and the white band of the primaries rather more distinct. These differences, however, are hardly specific. As regards the species in Central America, our specimens from the Panama railway agree rather with those from Antioquia, whilst those from Chiriqui and Nicaragua are just like the Venezuelan insect. As yet no specimens have reached us from Costa Rica; but it is certainly to be found in the hot low-lying forests of that country. Nicaragua seems to be the extreme limit of its range in this direction. In Guatemala and Southern Mexico *C. uranus* entirely takes the place of *C. atreus*, a species closely allied to it no doubt, but with unmistakable specific characters.

Another species allied to *C. atreus* has been described by Mr. Druce as *C. dentina**, and said to be from South Peru. This insect has hardly any white on the primaries; and the orange band of the secondaries is creamy white. It is a local form, perhaps not really separable from *C. atreus*. The locality given for it can hardly be correct; and we believe it should be looked for in the forest-region of Western Ecuador, whence Mr. Edward Whymper has recently brought home a specimen, which we have had an opportunity of examining.

* Trans. Ent. Soc. 1874, p. 155.

7. *Caligo uranus*.

Caligo uranus, H.-Sch. Samml. ausserenr. Schmett. p. 55, ff. 1, 2¹.

Pavonia uranus, Boisd. Lép. Guat. p. 57².

Pavonia telemachus, Hew. Zoologist, viii. p. 2976³.

C. atreo similis, sed anticis fere omnino cyaneo suffusis et margine posticarum externo ab angulo apicali ad angulum analem late aurantiaco distinguendus.

Hab. MEXICO^{1 3}, Cordova (*Höge*); GUATEMALA, Quirigua, Polochic valley, forests of Northern Vera Paz and Retalhuleu (*F. D. G. & O. S.*), Rio Naranjo and Mirandilla (*Champion*); HONDURAS^{2 ?}

As already stated, this species is closely allied to *C. atreus*, and takes the place of that butterfly in Southern Mexico and Guatemala. The most obvious difference is in the orange band of the secondaries, which here occupies the whole outer margin of the wing, including the apical angle; the primaries, too, have the blue gloss more extensively spread.

C. uranus, besides being found in Southern Mexico, is not an uncommon butterfly in the hottest forests of Guatemala. We found it in such places, amongst the Indian ruins of Quirigua, in the Motagua valley, throughout the dense forests of Northern Vera Paz, on the track to Peten, and also in the forests of the Pacific coast, where also Mr. Champion has recently met with it in several places.

Its habits are like those of its congeners. It flies a few feet from the ground in the forest, going a short distance when disturbed, and settling on the stems of the trees.

ERYPHANIS.

Eryphanis, Boisdual, Lép. Guat. p. 57 (1874).

The members of this genus, of which *E. automedon*, Cr., is the typical species, were placed in the genus *Caligo* until Boisdual separated them in 1874. This step seems to be justified, as a comparison of the following characters with those of *Caligo* will show:—The body is rather slender, the prediscoidal cell being, as in *Caligo*, quite small; there is a denuded patch on the submedian nervure of the secondaries of the male, but no central tuft of hairs; the male, too, has a peculiar oval patch of long closely felted scales near the anal angle. The coxa of the front leg of the male is rather slender and shorter than the femur. The tegumen of the male has a long slightly curved slender hook, and on the ventral surface on either side a rectangular lobe, the ventral edge of which is smooth, without serrations or spur as in *Caligo*; the harpagones are long, slender, and simple, without lobes, but strongly dentate on their dorsal edge.

Eight or nine species are now known of the genus, which is a purely Neotropical one and spread over the whole of tropical America as far south as Brazil. Of these three are

found within our borders, whereof one (*E. æsacus*) is peculiar to Mexico and Guatemala; the others (*E. bubocula* and *E. wardi*) just enter South America, being found in the Colombian State of Oaxaca.

a. Outer margin of secondary wings distinctly angulated.

1. *Eryphanis wardi*. (Tab. XIII. figg. 1, 2.)

Eryphanis wardi, Boisd. Lép. Guat. p. 58¹.

Pavonia automedon, Bates, P. Z. S. 1863, p. 249² (nec Cramer).

Caligo automedon, Butl. & Druce, P. Z. S. 1874, p. 339³ (nec Cramer).

Alis supra brunneo-fuscis, area anticarum interna et plaga magna in dimidio externo posticarum violaceo-cyaneo tinctis; anticis linea obsoleta submarginali fulva ad apicem bifida et punctis albis subapicalibus costam versus notatis; posticis area anali nigro induta; subtus sordide brunneis nigro irroratis, stria communi nigra a costa media anticarum ad angulum analem posticarum ducta; alis intus albicantioribus, extus area haud irrorata sed lineis variis valde sinuatis notatis et in posticis ocellis duobus ornatis, uno costam attingente, altero extra cellulam; hac area in anticis linea sinuata ultra cellulam terminata; linea altera latiore submarginali quam margo magis sinuata, inter ramos radiales ocellos duos aut tres includente, duabus lineis submarginalibus quoque notatis; anticarum cellula tota lineis variis distinctis scripta.

♀ mare major, fascia anticarum submarginali paginæ superioris multo magis distincta et area discoidali distali ochraceo suffusa, posticis nigro late marginatis area interna cæruleo leviter tincta.

Hab. NICARAGUA¹, Chontales (*Belt*); COSTA RICA (*Van Patten*³); PANAMA, Chiriqui, Veraguas (*Arcé*), Lion-Hill station (*M^cLeannan*²).—COLOMBIA.

This is a slightly modified northern race of *E. automedon* of Guiana and the Amazons valley. From this it differs in being rather larger, in the violet colour of the primaries being of a rather more rosy tint, and in having an indistinct submarginal stripe, bifid towards the apical angle, and enclosing two more or less distinct black spots; beneath it is paler and of a reddish brown, mottled and marked after the pattern of *E. automedon*. The females are paler on the upperside and of a more ochraceous colour. In the series before us there is a slight variation in the rosy tint of the primaries of different specimens. This species was described by Boisduval, who says that it is found in collections sent from Guatemala and Nicaragua. We ourselves have never seen it from further north than the latter country, and are inclined to doubt whether it extends its range into Guatemala, as it has never been sent in the numerous and large collections we have received from there. We trace it as far south as Colombia. In Ecuador, Guiana, and southward its place is taken by a smaller species, with wings of purer blue, the true *E. automedon* of Cramer, and in Brazil by *E. amphimedon*, Feld. We have figured a male from Nicaragua.

b. Outer margin of secondaries rounded.

2. *Eryphanis æsacus*.

Caligo æsacus, H.-Schäff. Aussereur. Schmett. ff. 3, 4.

Eryphanis æsacus, Boisd. Lép. Guat. p. 58.

BIOL. CENT.-AMER., Rhopal., Vol. I., October 1881.

Alis fuscis, dimidio exterioro violaceo tinctis, anticis linea indistincta submarginali apud apicem bifida et puncta duo nigra includente ochracea; posticis plaga magna apud angulum analem nigra in certa luce violaceo tincta; subtus ochraceis, fascia lata transversa communi fusca, anticis figuris nigris et albidis notatis intus et extus albido marginatis, posticis ocellis supra et binis infra cellulam; ceteris partibus fusco marmoratis. ♀ multo pallidiore, area interna cæruleo lavata, anticis linea submarginali ochraceo notata.

Hab. MEXICO¹, Cordova (*Rümeli*), Oaxaca (*Fenochio*); GUATEMALA, Chuacus and Polochic valley (*F. D. G. & O. S.*), Rio Naranjo (*Champion*); NICARAGUA, Chontales (*Belt*).

This is the smallest species of the genus with which we are acquainted, and may readily be distinguished from the last at first sight by the large black patch, showing a deep purple in certain lights, towards the anal angle of the secondaries, which are rounded instead of angulated. The basal portion of the wings is not tinged with violet; but this colour extends over the outer half of the anterior and the apical area of the posterior wings. The underside is more strongly mottled in this than the last species; and the central transverse band is margined externally and internally with a creamy colour; there is a double ocellus below the cell with a yellow border, a single one outside above.

Originally described from Mexico¹, this species does not appear to be very common in that country. The same may be said of Guatemala, where it is very local. Most of our specimens were taken at Chuacus, a village lying at an elevation of nearly 3000 feet, in a small valley which opens out into that of the Motagua. Here it frequented thin scrubby forest, which abounds in that district. We also obtained specimens from the Polochic valley; and Mr. Champion has recently sent us others from Rio Naranjo, on the Pacific side of the Cordillera. From Nicaragua we have only a single female specimen, which, though rather large, agrees on the underside better with this species than with *E. bubocula*.

3. *Eryphanis bubocula*. (Tab. XV. figg. 1, 2 ♂, fig. 3 ♀.)

Caligo bubocula, Butl. Cist. Ent. i. p. 74¹; Butl. & Druce, P. Z. S. 1874, p. 339².

E. æsaco similis, sed major, et posticis colore violaceo margine externo solum apicem versus notatis, subtus alis multo fortius picturatis.

Hab. COSTA RICA (*Van Patten*¹²), Cache (*Rogers*); PANAMA, Chiriqui (*Arcé*).—COLOMBIA.

This race takes the place of its northern ally *E. æsacus* in Costa Rica, and extends into Colombia, whence we have a specimen from the State of Antioquia. It differs chiefly from the preceding in its much larger size and in having the violet colour of the posterior wings restricted to the outer margin towards the apex, while in *E. æsacus* this colour occupies the discal area within the black patch. In some Costa-Rican examples, however, there are a few violet scales in this portion of the wing, showing almost a

transition from the one to the other. The much larger size, however, of the southern specimens, coupled with the more strongly pronounced markings of the undersurface, and also the absence of the continuous violet on the discal area of the secondaries, in addition to the greater faintness of the submarginal ochreous line in the primaries, enable one without difficulty to discriminate between the two forms.

E. bubocula was described by Mr. Butler from specimens in Van Patten's Costa-Rica collection, whence we have also received examples, as well as others from the State of Panama. None of these are females, and that sex is only known to us from a specimen in Dr. Staudinger's collection. We hesitate to admit that the Mexican females in the British Museum, alluded to by Mr. Butler in his description, really belong here. If the locality given to them is correct, it is far more probable they will prove to be females of *E. asacus*. Our figures are taken, the male from one of the types from Costa Rica, the female from the one in Dr. Staudinger's collection already alluded to, and which came from the State of Panama.

NAROPE.

Narope, Westwood, Gen. Diurn. Lep. p. 348 (1851).

Seven species have now been described of this peculiar genus, which, though not nearly allied to any of the foregoing genera, clearly belongs to the Brassolinæ, a position indicated for them by Prof. Westwood. As in *Opsiphanes*, the prediscoidal cell of the secondaries is large; but the terminal joint of the palpi is longer than usual in this subfamily. There is a tuft of hair on the underside of the primaries above the middle of the submedian nervure, and a denuded patch to correspond on the upperside of the secondaries near the costa. The tegumen of the male (in *N. cyllastros*) has a pair of peculiar short spurs, one on each side of the ventral surface, directed outwards; the harpagones have a simple dorsal edge, with a strong tooth near the extremity and another at the end.

Only one of the seven species is found in Central America; the rest are widely dispersed over South America, being found in Ecuador, Peru, Bolivia, and Brazil. None are as yet known from Guiana, though one is said to have been taken at Para.

From what is said below it is probable that all the species are nocturnal in their habits; and as the underside of the wings has the coloration of a dead leaf, when at rest during the day with wings closed they must be very difficult indeed to detect. Hence their great scarcity in collections.

1. *Narope testacea*. (Tab. XV. figg. 4, 5 ♂, fig. 6 ♀.)

Narope testacea, Godm. & Salv. Ann. & Mag. Nat. Hist. ser. 5, ii. p. 259¹.

Alis supra obscuro testaceis, antecarum apicibus et posticarum dimidio basali obscure fuscis; subtus pallide fuscis, atomis et maculis obscuris irroratis, plerumque ex lineis plus minusve margini externo parallelis compositis; posticis macula parva ad costæ medium nigra notatis.

♀ margine anticarum externo convexo, posticis paulo angulatis; alis supra fuscis, subtus punctis parvis nigris maculatis; linea pallida ab apice anticarum ad marginem internum eunte.

Hab. PANAMA, Chiriqui (*Ribbe*¹).

The only specimens we have seen of this species are the types in Dr. Staudinger's collection, which were taken at Chiriqui by Herr Ribbe, who has since informed us that they came to sugar placed at night for capturing Heterocera. It would thus appear that the great apparent rarity of all the members of this genus is probably due to their nocturnal habits.

Subfam. *ACRÆINÆ* *.

ACTINOTE.

Actinote, Hübner, Verz. bek. Schmett. p. 27 (1816).

Acræa, Doubleday, Gen. Diurn. Lep. p. 137 (partim).

This section of the old genus *Acræa* contains nearly fifty South-American species, which are distributed throughout tropical America from Southern Mexico to the Argentine republic, the metropolis of the genus being Ecuador and Peru. Whether any are found in Guiana is doubtful. Within our region four species occur, only one of which reaches Southern Mexico; one is peculiar to Costa Rica; and two are widely distributed over the country, one of which passes into the northern part of South America.

Actinote may readily be recognized from the Old-World representatives of *Acræa* by the tibia of the front legs of the male being very short, and the tarsus being altogether absent, or only present in a single short rudimentary joint. In *A. antea*s the femur is considerably longer than the coxa; but in *A. nox* and some of its southern allies these joints are nearly equal. In *A. horta*, which should be taken as the type of the genus *Acræa*, the tibia is comparatively long, and there is a well-developed single tarsal joint. In other forms, such as *A. natalica*, the tarsus consists of four slender joints. Regarding the secondary sexual male characters, *Actinote* does not differ materially from *Acræa*, as represented by *A. horta*; the tegumen is a simple slender hook, and the harpagones also simple, without teeth; the chitinous piece which projects backwards along the ventral surface of the abdomen is very broad, and shaped somewhat

* Doubleday, who seems to have paid considerable attention to this subfamily, divided it into six sections, but kept them all in the single genus *Acræa*. A thorough revision of these insects would, we are confident, fully justify their division into several genera; for not only do we find very diverse conditions in the proportion of the joints in the front legs of the male, but also in the size and shape of the penis and the secondary sexual male organs. The American members of the subfamily, so far as we have been able to examine them, seem fairly constant in their characters; and for them we use Hübner's title *Actinote*, and give a few of its leading characters under the generic heading.

like the toe of a shoe; the penis is a sharp-pointed chitinous rod of moderate length. In *A. natalica* this organ is enormously developed, being .4 inch in length.

Regarding the neururation of the wings, on which Doubleday laid considerable stress when compiling the sections of the genus *Acræa*, we find that *Actinote* does not materially differ from *Acræa horta*. In other Old-World forms important differences are observable.

1. **Actinote anteias.** (*Acræa anteias*, Tab. XVI. fig. 1.)

Acræa anteias, Doubl. & Hew. Gen. Diurn. Lep. p. 142, t. 18. f. 5¹.

Actinote anteias, Dist. Pr. Ent. Soc. 1876, p. xiv².

Actinote thalia, Butl. & Druce, P. Z. S. 1874, p. 352³.

Alis nigro-fuscis, anticis maculis duabus intra cellulam alteraque inter venas medianam et submedianam, fascia quoque lata subapicali venis divisa flavidis; posticis area interiore ferrugineo-flava, venis et stria inter venas nigro notatis; subtus alis dilutioribus et marginibus flavido et nigro radiolatis.

Hab. GUATEMALA, Central valleys (*F. D. G. & O. S.*), San Gerónimo (*Champion*), El Zumbador (*Champion*); COSTA RICA (*Van Patten*³); Talamanca (*Gabb*²), San Francisco (*Rogers*); PANAMA, Chiriqui (*Arcé*, *Zahn*, *Champion*), Calobre (*Arcé*).—COLOMBIA; VENEZUELA¹.

It is open to question whether *A. anteias*, which was originally described from Venezuelan specimens, is really separable from *A. thalia* (Linn.) from Brazil; and the only distinction that we can trace is in the greater width of the subapical band of the primaries in the northern form, and their yellower less ferruginous colour. But these characters fail us when Colombian specimens are examined, both races being apparently represented in that country. In Central America we find *A. anteias* agreeing with the Venezuelan insect; but even here some variation can be traced, which chiefly affects the extent of the yellow spots of the base of the primaries, as well as the subapical band; but these variations seem to be purely individual. We have never as yet seen an *Actinote* of this form from Guiana; and Mr. Bates only captured one specimen at Para, which he called *Acræa thalia**. A little further east, at Maranhão, this insect appears to be much more common, as we have several specimens from there captured by the late Mr. T. Belt. These differ more from the true *A. thalia* than *A. anteias* does, the rusty yellow of the base of the wings being of greater extent, forming a large subtriangular nearly confluent patch. This race should also probably have a name.

Actinote anteias is abundant in the valleys of the interior of Guatemala up to an elevation of about 3000 feet. It is not, so far as we know, found in the forests of the low-lying lands; and this may account for its not having been sent us from Nicaragua or the line of the Panama railway.

2. **Actinote guatemalena.** (*Acræa anteias*, Tab. XVI. fig. 2).

Acræa guatemalena, Bates, Ent. Monthl. Mag. i. p. 58¹.

* Trans. Linn. Soc. xxiii. p. 564.

A. antea similis, sed alis obscurioribus, anticis maculis omnibus minoribus et sordide flavis, posticis colore eodem anguste striatis.

Hab. GUATEMALA, Polochic valley (*F. D. G. & O. S.*¹); NICARAGUA, Chontales (*Janson & Belt*).

Mr. Bates described this insect from examples procured by us in the valley of the Polochic in 1861. It is allied to *A. antea*, but is very much darker, and the markings of both wings are of a pale dirty yellow. Both Janson and Belt have also sent it from Chontales; these latter specimens are rather brighter in colour than those from Guatemala.

At one time we thought that this species was the female of *A. antea*; but a closer examination has convinced us that this is not the case, as we have both sexes of each species, showing conclusively their distinction.

The range of *A. guatemalena* is somewhat different from that of *A. antea*, it being found in Guatemala exclusively in the valley of the Polochic, and occurring again in Nicaragua; but in Costa Rica the next species appears to take its place. In South America it has a close ally in *A. æquatoria*, Bates, and some other not very definite forms. We have figured one of the types, which is a male, and not a female as stated on the Plate.

3. *Actinote melampepos*, sp. n.

A. guatemalena similis, sed alis anticis maculis basalibus et fascia apicali latioribus, posticis leviter ferrugineo tinctis.

Hab. COSTA RICA (*Van Patten*).

This is closely allied to the last-named species, but seems to us to require specific distinction. It may readily be known from *A. guatemalena* by having the basal spots and subapical bands of the primaries much wider, and the interior area of the secondaries tinged with ferruginous. We have seven specimens in our collection, all of which have the same characteristics. These were sent by Dr. Van Patten from Costa Rica, and were probably considered by Messrs. Butler and Druce to be females of what they called *A. thalia*.

4. *Actinote nox*. (*Acræa nox*, Tab. XVI. figg. 3, 4 ♂, 5, 6 ♀).

Acræa nox, Bates, Ent. Monthl. Mag. i. p. 59¹.

Actinote nox, Butl. & Druce, P. Z. S. 1874, p. 352.

Acræa leucomelas, Bates, Ent. Monthl. Mag. i. p. 59.

Acræa orizava, Reakirt, Pr. Ac. Phil. 1866, p. 243.

♂. Alis nigris nitentibus, subtus nigris, anticis macula basali triangulari magna, posticis minore ochraceis.

♀. Alis nigrescentibus, macula trifida in area mediana ochracea, subtus pallide ochraceis nigro striatis et anticis macula magna in area mediana ochracea.

Hab. MEXICO, Cordova (*Rümeli*), Jalapa (*Höge*); GUATEMALA, Dueñas, central valleys,

and San Gerónimo (*F. D. G. & O. S.*), Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*); Volcan de Irazu and San Francisco (*Rogers*); PANAMA, Chiriqui, Veraguas (*Arcé, Champion*).

This is a common widely-ranging species in Mexico and Central America, being found from the southern parts of the former country to the State of Panama. Females of it are subject to some variation in the extent of the yellow spots of the primaries; and one from Mexico, in which these marks were unusually developed, was described by Mr. Reakirt as *A. orizava*; but we do not see any grounds for considering the Mexican race distinct. Males are very uniform in their colour; but one specimen we have from Nicaragua has a few yellow scales in the middle of the primaries.

Actinote nox frequents scrubby woods, of elevation varying from 3000 to 5000 feet; and the two sexes, originally described by Mr. Bates as distinct species, may be seen flying together, often in considerable numbers. Its allies in South America are *A. ozomene* of Colombia, and an undescribed species from the State of Antioquia, which has the base of the primaries beneath rufous instead of pure yellow.

Our figures are from typical specimens, the male from the Polochic valley, and the female from Dueñas.

Subfam. *HELICONINÆ*.

HELICONIUS.

Heliconia, Latreille, Hist. Nat. Crust. Ins. xiv. p. 108 (1805).

Heliconius, Felder, Wien. ent. Monatschr. vi. p. 79; Bates, Trans. Linn. Soc. xxiii. p. 553.

This is one of the largest and most characteristic genera of the Butterfly-fauna of Tropical America, the number of described species it contains now exceeding 100. In structure the whole of these are exceedingly similar, both as to the neururation of the wings and also the form of the legs; but great diversity exists in the shape of the wings and in the pattern of their coloration. A satisfactory arrangement of the various species is hardly possible, as the groups into which the most marked forms may be separated are blended by intermediate species, so as to obscure the characters of demarcation. We have nevertheless attempted to sort the species which we here treat of by the pattern of the wings; but this arrangement is only approximately a natural one.

Twenty-seven species are here included as inhabitants of Central America and Mexico, the larger proportion of which are peculiar to the country. Eight species only are also found outside our limits; and of these seven belong to the northern parts of South America, and *H. charithonia* is also common in the West-Indian Islands.

The secondary sexual male organs in *Heliconius* are of a complicated character, and not easily comprehended from specimens that have been once dried. So far as we can see from an examination of several species, there is great uniformity in the arrangement

of the different parts; but at the same time specific peculiarities exist. The tegumen has, on the ventral surface inside the cavity, a piece like an inverted stirrup, which is pointed at the end and directed outwards; the harpagones have a strong bar along the lower edge; and this seems to be joined to the tegumen by a continuous membrane, the folds of which give rise to much confusion by obscuring the outlines of the whole structure. On the harpagones there are no dentations; but they terminate in a blunt end. The penis, in every species examined, is very short.

As the proportion of the joints of the front leg of the male *H. erato* differs from that of other members of the genus here treated of, we use this character to separate this species from the rest. Our other divisions rest on the colour-pattern of the wings alone.

- a.* Femur of front legs of the male slender, longer than the coxa; tibia and tarsus also slender; body usually elongated, projecting beyond the anal angle of the secondaries.
- a'.* Wings ferruginous or tawny, with black margins and black transverse marks on one or both wings; or extremity of primaries black, with yellow or white spots.

1. *Heliconius melicerta*. (Tab. XVI. figg. 12, 13.)

Heliconius melicerta, Bates, Ent. Monthl. Mag. iii. p. 87¹.

Alis supra ferrugineis, anticis costa, macula discali, altera ad cellulæ finem, area apicali tota et margine posticarum late nigris; anticis plaga magna, extus valde sinuata ad cellulæ finem a costa ad angulum analem extensa; serie macularum subapicali, una inter ramos medianos secundum et tertium, duabus ad angulum analem et duabus angulum posticarum apicalem versus læte flavis; subtus et supra posticis maculis submarginalibus et duabus ad angulum apicalem albis; antennis flavis, ad basin nigris.

Hab. PANAMA, Lion-Hill station (*M^cLeannan*¹).—COLOMBIA¹.

A species allied to the well-known *H. sylvanus* (Cr.), of Guiana, but differs in many particulars, fully described by Mr. Bates¹. It is a larger species, with broader primaries; the yellow patch at the end of the cell nearly absorbs the macular band beyond the cell, leaving only some black spots within its area.

Two specimens only, strictly referable to this species, have reached us from Panama, one of which (the type) is figured; but we have a good series from Colombia, where it occurs not only at Frontino in the Cauca valley, but also near San Buenaventura, on the west coast. Some little variation is to be traced in these, as might be expected; this chiefly affects the large median yellow spot of the primaries, which in some cases encroaches more on the apex of the wing than in others.

2. *Heliconius albucilla*. (Tab. XVI. figg. 7, 8, and fig. 9, var.)

Heliconius albucilla, Bates, Ent. Monthl. Mag. iii. p. 88¹.

H. melicerta similis, sed maculis anticearum albidis aut sordide fulvis nec flavis, posticis margine externo angusto et fascia transversa nigra distinguendus.

Hab. PANAMA, Lion-Hill station (*M^cLeannan*¹), Veraguas (*Arcé*).

Except for the very obvious difference of having a black band crossing the secondaries, this insect might pass for an abnormal variety of *H. melicerta*; but this can hardly be the case. It appears to be a very rare species, as we have as yet only obtained three specimens. Two of these, both from Panama and both figured, differ considerably from one another: both have the black band of the secondaries; but the markings of the primaries, which in one are white, in the other are dingy fulvous.

We possess a specimen which was obtained by Mr. Birchall, probably in Northern Colombia, which closely resembles the type of *H. albucilla*; but in this example the bands of the secondaries only reach half across the wing, and the white spot of the primaries is purer and more extended. It is thus probable that a race allied to *H. albucilla* exists in Northern Colombia.

3. *Heliconius claudia*, sp. n.

H. melicerta valde similis, sed alis angustioribus et rufescentioribus; maculis anticearum duabus analibus absentibus, et macula discali haud rotundata sed basin versus elongata, distinguendus.

Hab. PANAMA, Calobre (*Arcé*).

This form seems to take the place of *H. melicerta* in the western and more mountainous portion of the State of Panama. In the shape of its wings it more nearly resembles *H. sylvanus*; but in coloration it agrees with *H. melicerta*, except that the ferruginous tint of the base of the wings is of a deeper shade, the discal black spot is not round, but elongated in the direction of the body, and the two yellow spots of the anal angle are always absent. These differences are slight; but, being constant, they certainly seem to point to a distinction between the two forms.

4. *Heliconius fornarina*.

Heliconia fornarina, Hew. Ex. Butt., Hel. t. 3. f. 9¹.

Alis fusco-nigris, anticis plaga irregulari lata per cellulæ finem flava maculas tres includente nigras fasciisque duabus maculosis exterioribus coloris ejusdem; posticis puncto ad apicem flavo, nonnunquam anticis linea mediana, posticis altera per cellulam transversa rufa; subtus ut supra, sed alis dilutioribus, anticis ad basin rufescentibus, posticis costa fasciisque duabus transversis rufis; margine externo albo punctato, maculis duabus ad apicem coloris ejusdem; antennis nigris, finem versus flavis.

Hab. GUATEMALA, Retalhuleu and El Idolo (*F. D. G. & O. S.*), Paraiso, El Reposo, San Isidro, Coatepeque, Rio Naranjo and Mirandilla (*Champion*).

Hewitson described and figured this species from a specimen in the British Museum, the origin of which is unknown¹. Since then we have found it to be not uncommon in BIOL. CENT.-AMER., Rhopal., Vol. I., October 1881.

the forests of Guatemala bordering the Pacific Ocean, where it appears to be peculiar, as we never met with it elsewhere in that country. Besides the specimens we obtained ourselves, Mr. Champion has recently sent us a good series. We thus see that it is subject to slight variation in different individuals. Some insects have the base of the primaries wholly black, others have a dark rufous streak over the median nervure and another at the base of the secondaries. The large yellow median spot of the primaries is sometimes almost broken up into spots by the encroachment of the black of the wings.

The chief resort of *H. fornarina* is the virgin forest lying at an elevation between 1000 and 2000 feet; and it does not seem to pass much beyond these limits. Here it is not uncommon, and may be seen flying in shaded roads.

5. *Heliconius chrysantis*, sp. n.

Alis anticis nigris, margine interno late ferrugineo; macula irregulari magna ad cellulæ finem venis divisa, maculas duas nigras includente, fasciis maculosis ultra eam ad apicem flavis, punctis tribus submarginalibus ad angulum analem; posticis ferrugineis nigro marginatis, maculis duabus ad apicem et stria transversa per cellulam flavis; subtus fere ut supra, alis maculis albis submarginalibus ornatis, posticis macula quoque ad costæ medium flava.

Hab. NICARAGUA (*Bridges*).

Of this species only a single specimen has yet reached us. This was obtained some years ago by the late Mr. T. Bridges, somewhere on the shores of the lake of Nicaragua. It is not in very good condition, the secondaries being not quite fully developed; we have thus long hesitated to describe it, hoping to obtain better examples. In having a yellow streak across the cell of the secondaries, and a yellow spot near the middle of the costa of the same wings beneath, this species is peculiar; otherwise it is not unlike *H. zuleika*, the inner and second band of yellow spots of the primaries of that species being united imperfectly into one large spot.

6. *Heliconius jucundus*. (Tab. XVII. figg. 1, 2; *H. xanthicus*, Tab. XVI. figg. 10, 11).

Heliconius jucundus, Bates, Ent. Monthl. Mag. i. p. 56¹.

Heliconius xanthicus, Bates, Ent. Monthl. Mag. i. p. 57².

Alis anticis nigris, triente basali (costa excepta) aurantiaco-fulvo, area apicali fasciis quatuor albis maculosis transvittata, tertia a quarta propiore a secunda magis distante; posticis aurantiaco-fulvis nigro marginatis et litura nigra transfasciatis, puncto albo ad angulum apicalem; subtus ut supra, posticis maculis albis submarginalibus ornatis.

Var. *H. xanthicus*, maculis anticarum omnibus flavis nec albis, litura transversa posticarum ad marginem internum obsoleta.

Hab. PANAMA, Lion-Hill station (*M^r Leannan*), Veraguas (*Arcé*).

This butterfly, in the normal form prevalent on the isthmus of Panama, is very distinct in its characters; but specimens are not wanting which diverge considerably

from the type, and approach the more northern *H. zuleika* in coloration. *H. zuleika*, on the other hand, is also subject to variation in the colour of the spots of the primaries, and thus approaches *H. jucundus*; so that there seems to be almost a gradual passage from one to the other.

The most obvious distinction between the two is the black transverse band of the secondaries, present in *H. jucundus*, but absent in *H. zuleika*. In some specimens of the former this is evanescent, and in one entirely wanting. The colour of the spots of the primaries is another distinctive character, those of *H. jucundus* being white, and those of *H. zuleika* yellow; but we have specimens of the former in which some spots are yellow and others white; and in some, as in the type of *H. xanthicus*, they are all yellow. In *H. zuleika*, on the other hand, the same thing occurs in a few specimens from the southern extremity of its range; some of the spots are white, and some yellow; and in one from the western part of the State of Panama all the spots are white, as in *H. jucundus*. The best guide to distinguish these insects seems to be the colour of the base of the cell of the primaries. This part in *H. jucundus* is orange-tawny, the costa alone and a spot in the middle of the cell being black, whereas in *H. zuleika* the costa, this spot, and the whole of the base of the cell are uniform black, which colour unites with the black of the apex of the wing.

As regards *H. xanthicus*, which Mr. Bates separated from *H. jucundus* with some hesitation¹, we are now of opinion that it is not deserving of this distinction, as it is found with *H. jucundus*, and a series of specimens in our collection unites it with that species by almost insensible steps.

H. jucundus seems to be common about the line of railway across the isthmus of Panama, whence the late James M'Leannan sent us a quantity of specimens. In its typical coloration it seems almost restricted to this limited district, as in the western portions of the State of Panama *H. zuleika* entirely supplants it.

7. *Heliconius zuleika*.

Heliconia zuleika, Hew. Ex. Butt., Hel. t. 3. f. 10¹; Boisd. Lép. Guat. p. 30².

Heliconius zuleika, Butl. & Druce, P. Z. S. 1874, p. 351³.

H. jucundo similis, sed maculis anticarum flavis, nec albis, cellula ad basin tota nigra nec aurantiaco-fulva, et fascia transversa posticarum absente, diversus.

Hab. GUATEMALA, Yzabal (*F. D. G. & O. S.*); NICARAGUA^{1 2} (*Bridges*), Chontales (*Janson*); COSTA RICA (*Van Patten*³), Volcan de Irazu (*Rogers*); PANAMA, Volcan de Chiriqui, 2000 to 3000 feet (*Champion*), Veraguas (*Arcé*).

As will be seen above, this species has a much wider range than *H. jucundus*, extending as far north as Guatemala, where, however, it is rare, the only specimens we have from there having been captured by ourselves in the forests close to Yzabal. In Nicaragua and thence southwards to the State of Panama it is much more common,

judging from the number of specimens that have been sent from those places. It is along its southern border, in the State of Panama, that varieties occur, some specimens having the spots of the primaries white, some yellow and white. One of our Guatemala examples has indications of a transverse band on the secondaries.

This is a forest-loving species, flying under the shade of the largest trees, not far from the ground.

8. *Heliconius octavia*. (Tab. XVII. figg. 9, 10.)

Heliconius octavia, Bates, Ent. Monthl. Mag. iii. p. 86¹.

Alis anticis productis, costa arcuata margine externo paulo incurvo, nigris, regione venæ medianæ ferrugineo-fulva, fasciis duabus maculosis flavis, una a costæ medio ad marginem externum, altera transversa apud apicem, et punctis quinque submarginalibus flavis; posticis ferrugineo-fulvis, margine nigro maculis submarginalibus flavis notato. Subtus ut supra, sed alis obscurioribus et colore fulvo rufo-brunneo, posticis area interna lilacino tincta et plaga magna costali notatis, antennis nigris.

♀ mari similis, sed maculis anticarum fulvis nec flavis, colore ferrugineo alarum multo magis fulvo, stria fulva apud venam medianam ad angulum analem extensa et antennis plerumque flavis distinguenda.

Hab. GUATEMALA, Dueñas (*F. D. G. & O. S.*¹), Panán, Las Mercedes, San Isidro, Cerro Zunil, Volcan de Atitlan, Mirandilla (*Champion*).

This species and *H. formosus* belong to a small section of the genus *Heliconius*, the members of which have each a species of *Tithorea* with a similar pattern of coloration. Thus *H. octavia* has a close colour resemblance to *T. duenna*.

H. octavia is a rare species in Guatemala, being confined, so far as we know, to the forests of the mountains sloping towards the Pacific Ocean. It was here that we first met with it, on the road from Dueñas to the coast, between the volcanos of Agua and Fuego, at an altitude of about 4000 feet. It is also found at a much lower level, as Mr. Champion, to whom we are indebted for a fine series of specimens, took it at various places in the Pacific coast region of Guatemala, as low as 1500 feet above the sea. To Mr. Champion we owe the discovery of the female of this butterfly, of which he has sent us several specimens. These differ from the males, as pointed out above, an unusual circumstance in this genus, the sexes in which are nearly alike in their coloration.

9. *Heliconius formosus*. (Tab. XVII. figg. 7, 8.)

Heliconius formosus, Bates, Ent. Monthl. Mag. iii. p. 87¹; Butl. & Druce, P. Z. S. 1874, p. 351².

Heliconius hecalesia, Bates, P. Z. S. 1863, p. 247³ (nec Hew.).

H. octaviæ similis et eadem figura, sed supra anticis fere omnino nigris, posticis colore marginis nigro ad apicem concentrato, colore lilacino areæ discoidalis absente, distinguendus.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²); PANAMA, Volcan de Chiriqui, 2000 to 3000 feet (*Champion, Arcé*), Veraguas (*Arcé*) Lion-Hill station (*M. Leannan*^{1 3}).

This species takes the place of the Guatemalan *H. octavia* in the southern section of

the great Central-American isthmus, and is found from Nicaragua to the line of the Panama railway. Southwards of this, in the northern part of Colombia, *H. hecalesia*, Hew., takes its place; and on the west coast it is represented by a species allied to *H. gynæsia*, Hew. All these species, and also *H. longarena*, Hew., have the submarginal row of yellow spots very well developed and placed in a row parallel to the margin. In *H. formosus* the black margin is almost restricted to the apical angle, where the yellow spots are comparatively small. This character also serves to distinguish it from *H. octavia*, from which it can be also known by the base of the primaries being nearly black. In this last character some variation is visible in different individuals. One specimen from the Volcan de Chiriqui is somewhat remarkable in having the black border of the apex of the secondaries more extensive, and the yellow spots larger and more elongate. It thus, to a slight extent, approaches *H. hecalesia*.

The *Tithorea* which resembles *H. formosus* in colour is *T. pinthias* *.

10. *Heliconius telchinia*.

Heliconia telchinia, Doubl. & Hew. Gen. Diurn. Lep. p. 104, t. 14. f. 4¹.

Heliconius telchinia, Butl. & Druce, P. Z. S. 1874, p. 351².

Alis anticis nigris, cellula (præter fasciam elongatam medianam) et regione venæ medianæ et rami ejus primi fulvis; fascia maculosa transversa ultra cellulam a costa ad medium marginis externi alteraque extra eam flavis; posticis fulvis, margine externo et fascia mediana transversa nigris; subtus ut supra, margine externo et fascia nigra posticarum transversa et costæ aliquot sericeis; anticarum apice et margine posticarum externo punctis albis ornatis, macula quoque alba ad angulum posticarum apicalem; antennis pro majore parte flavis.

Hab. MEXICO, Jalapa (*Deppe*), Cordova (*Rümeli*), Potrero (*Hedemann*); BRITISH HONDURAS, river Sarstoon (*Blancaneaux*); GUATEMALA, Yzabal, San Gerónimo, Choctum, Polochic valley, Retalhuleu (*F. D. G. & O. S.*), El Zumbador, Panima, Sabo, and Teleman (*Champion*); HONDURAS, San Pedro (*G. M. Whitely*); NICARAGUA, Chontales (*Janson*); COSTA RICA (*Van Patten*), Cache (*Rogers*).—VENEZUELA¹?

Though the type of this species is stated by Doubleday to have come from Venezuela, the figure of it undoubtedly represents a butterfly well known and common in Mexico and in Central America, the Venezuelan representative of which differs in several points, and has since been described by Mr. Butler as *H. metalilis*†. We therefore believe that the Venezuelan habitat ascribed to *H. telchinia* is erroneous, and that the species is restricted in its range to Central America and Mexico.

In Guatemala this *Heliconius* frequents the forests of the warmer parts of the country, and is found from the sea-level up to an elevation of about 3000 feet. *Melinæa imitata*‡ closely resembles *H. telchinia* in coloration, the two species being found together, though the former, so far as we know at present, has not so great a range in altitude. Southwards of Costa Rica we have no evidence of the presence of

* *Antea*, p. 10.

† *Cist. Ent. i.* p. 167.

‡ *Antea*, p. 13.

H. telchinia, the species which seems to take its place in the State of Panama being *H. clarescens*.

Note.—Under the name of *H. anderida*, Hewitson described a species of *Heliconius* allied to *H. telchinia*, which was said to be from Honduras. So far as we can see, the figure agrees very well with the Venezuelan butterfly since described by Mr. Butler as *H. metalilis*; and we strongly suspect that in this, as in so many other instances, the specimens were collected by Dyson, and that his Honduras and Venezuelan localities have been confused. If this surmise be correct, the name *H. metalilis* becomes a synonym of *H. anderida*, and the species must be removed from the Central-American fauna.

11. ***Heliconius clarescens*.** (Tab. XVII. figg. 5, 6.)

Heliconius clarescens, Butl. Ann. & Mag. N. H. ser. 4, xv. p. 223¹.

H. telchinæ similis, sed fascia nigra posticarum transversa nulla, et posticarum costa subtus haud nigra facile distinguendus.

Hab. PANAMA, Bugaba (*Arcé*), Volcan de Chiriqui, 2000 to 3000 feet (*Champion*).

This species is only known to us from a few specimens sent to this country from the neighbourhood of Chiriqui. One of these was described by Mr. Butler, whose type is before us. A second specimen, that represented on our Plate, differs in a few points from the type, in which the discal spot of the primaries is smaller, and an elongated yellow spot is indicated between the first and second median branches; the black border, too, of the secondaries is broader. In coloration *H. clarescens* has the pattern of *Melinæa scylax**.

12. ***Heliconius fasciatus*.** (Tab. XVII. figg. 3, 4.)

Heliconius fasciatus, Godm. & Salv. P. Z. S. 1877, p. 62¹.

H. jucundo similis, sed macula nigra in cellulæ medio parte apicali nigro conjuncta, punctis quatuor in linea ad apicem albis (his subtus fortioribus), posticis fascia transversa nigra bene definita, distinguendus.

Obs. *H. ismenio*, Latr., proxime affinis, sed posticis fascia transversa nigra integra et puncto posticarum ad apicem albo diversus.

Hab. PANAMA, Veraguas (*Arcé*), Lion-Hill station (*M^r Leannan*¹).

At first sight this *Heliconius* appears exceedingly like *H. jucundus*; but on closer inspection the different position of the apical row of white spots on the primaries at once distinguishes it. In *H. fasciatus* this row of spots follows the curve of the apex, lying close to the margin; in *H. jucundus* it lies obliquely across the wing further inside.

H. fasciatus, no doubt, takes the place of the Colombian *H. ismenius*, described and figured by Latreille in Humboldt's 'Recueil d'Observations de Zoologie'; but it

* *Antea*, p. 12.

constantly differs from that species in having a complete black band across the secondaries instead of only an incipient one.

It is by no means a common species; and M'Leannan only sent us a few specimens. Besides these, one other has reached us, taken further in the interior of the State of Panama.

b'. Wings with black and yellow transverse bands.

13. *Heliconius charithonia*.

Papilio charithonia, Linn. Syst. Nat. i. p. 757¹.

Papilio charithonia, Cr. Pap. Ex. t. 191. f. F².

Heliconia charithonia, Boisd. & Lec. Lép. Am. Sept. p. 140, t. 41³; Boisd. Lép. Guat. p. 28⁴.

Heliconius charithonia, Butl. & Druce, P. Z. S. 1874, p. 351⁵; Strecker, Cat. Macr.-Lep. N. Am. p. 107⁶.

Alis nigro-fuscis, anticis fasciis tribus obliquis (quarum intima a basi adscendente); posticis una transversa per cellulam, altera submarginali maculosa, punctisque minutis variis apud angulum analem, omnibus flavis, subtus alis dilutioribus ad basin punctis coccineis ornatis.

Hab. NORTH AMERICA^{2 3}, Florida⁶.—MEXICO³, Mazatlan (*Forrer*), Cordova (*Rümeli*), Oaxaca (*Fenochio*), Valladolid, Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, San Gerónimo, Chuacus, Dueñas (*F. D. G. & O. S.*), Zapote (*Champion*); HONDURAS⁴; NICARAGUA (*Bridges*), Chontales (*Janson*); COSTA RICA (*Van Patten*⁵), San Francisco (*Rogers*); PANAMA, Volcan de Chiriqui 2000 to 3000 feet (*Champion*), Chiriqui (*Arcé*).—COLOMBIA; VENEZUELA; ANTILLES^{4 6} generally.

H. charithonia is one of the oldest known species of butterflies, having been described and figured by Sloane in 1725* and by George Edwards in 1746†, the former giving it as an inhabitant of Jamaica, and the latter of the island of Montserrat. It is now known as one of the most universally-distributed species of the West-Indian Islands, and as equally common in Mexico and Central America. In North America it seems restricted to Florida, according to Mr. Strecker⁶, though previous writers give it a more extended range in that continent^{2 3}. In South America we do not trace it beyond the limits of Colombia and Venezuela. Mr. Bates does not include it in the butterfly-fauna of the Amazons valley; nor is it found in Guiana.

In Central America it ranges from the sea-level to an altitude of about 5000 feet, affecting the scrubby rather than the dense forest.

c'. Wings black, a yellow patch on the primaries, a red one on the secondaries.

14. *Heliconius hortensia*.

Heliconia hortense, Guér. Icon. Règn. Anim. iii. texte, p. 469¹.

Heliconia hortensia, Doubl. & Hcw. Gen. Diurn. Lep. p. 103, t. 15. f. 1²; Bois. Lép. Guat. p. 29³.

* Nat. Hist. Jam. ii. p. 217, t. 239. f. 15, 16.

† Nat. Hist. Birds, ii. t. 89.

Alis nigris, marginibus externis undulatis, anticis ad apicem valde hamatis, macula transversa irregulari venis divisis ad cellulæ finem flava; posticis area interna late rufo-coccinea; subtus alis dilutioribus, punctis ad basin coccineis, anticis regione apicali griseo notatis, posticis coloris ejusdem et in area mediana rubro-albicantibus, costa flava; antennis nigris.

Hab. MEXICO¹, Jalapa (*Deppe*), Oaxaca (*Fenochio*); BRITISH HONDURAS, river Sarstoon (*Blancaneaux*); GUATEMALA, Choctum, Chisoy valley, San Gerónimo, Motagua valley, Dueñas (*F. D. G. & O. S.*), Balheu, Panima, and Sabo (*Champion*); HONDURAS³.

This is a characteristic species of the temperate forests of Mexico and Guatemala, where it is found at an elevation as high as 6000 feet, whence it descends as low as 1000 feet above the sea-level; but it is more abundant in suitable localities, lying at an elevation of from 4000 to 5000 feet, than elsewhere. In such places it is very common in Guatemala, and widely distributed over the mountainous parts of the country.

Guérin, who first described *H. hortensia*, correctly gave its habitat as Mexico¹; but Doubleday² put it down as a Colombian species; on what grounds we cannot tell, but have no doubt he was wrong in so doing. We have no evidence of the occurrence of the insect south of Guatemala, except Boisduval's statement that he received it from Honduras³: this may well be correct; but the authority is untrustworthy.

15. *Heliconius montanus*. (Tab. XVII. fig. 11.)

Heliconius montanus, Salv. Ann. & Mag. N. H. ser. 4, vii. p. 414¹; Butl. & Druce, P. Z. S. 1874, p. 351².

H. hortensiae similis, sed marginibus externis vix undulatis et anticis ad apicem rotundatis (nec hamatis), fascia flava angustiore, diversus.

Hab. COSTA RICA (*Carmirol*¹, *Van Patten*²), Orosi (*Kramer*¹), Volcan de Irazu and San Francisco (*Rogers*); PANAMA, Chiriqui (*Zahn*).

Though we have compared this species with the one most nearly allied to it in our region, the Colombian *H. clysonymus*, Latr., is really its next of kin. From that insect it may be known by the much greater breadth of the red band of the secondaries. As both *H. montanus* and *H. clysonymus* are, like *H. hortensia*, species inhabiting mountainous countries, their respective ranges do not come into contact, being separated by the hot lowlands of the State of Panama and Northern Colombia. The slight difference between the two species, therefore, is not likely to be neutralized by intermediate forms.

The first specimen we received of *H. montanus* was obtained by Mr. Kramer, a botanist employed by Messrs. Veitch, near Orosi, in the Costa-Rican highlands. Since then we have seen a number of examples from the same district. These confirm the characters pointed out in our description, except as regards size. We now see no difference in this respect between *H. montanus* and *H. clysonymus*. The type being in rather poor condition, we have figured a fresher specimen from Costa Rica.

d'. Wings black, a red spot on the primaries.

16. *Heliconius petiveranus*.

Heliconia petiverana, Doubl. Gen. Diurn. Lep. p. 103¹ (ex Petiver, Gaz. t. 4. f. 2).

Heliconius petiverana, Butl. & Druce, P. Z. S. 1874, p. 351².

Heliconia demophoon, Ménétr. Cat. Mus. Petr. Lep. p. 86, t. 2. f. 4³.

Heliconius demophoon, Bates, P. Z. S. 1863, p. 247⁴; Dist. Pr. Ent. Soc. 1876, p. xiii⁵.

Heliconia mexicana, Boisd. Lép. Guat. p. 28⁶.

Heliconia rosina, Boisd. Lép. Guat. p. 29⁷; Butl. & Druce, P. Z. S. 1874, p. 351⁸.

Heliconia amaryllis, Dist. Pr. Ent. Soc. 1876, p. xiv⁹.

Alis nigris, anticis fascia transversa irregulariter ovata per cellulæ finem coccinea, posticis fascia transversa flava; subtus ut supra, macula antearum coccinea medialiter albicante, posticis punctis minutis ad basin coccineis ornatis et costæ parte proxima anguste flava.

Hab. MEXICO, Alvarado (*Deppe*), Acapulco (*A. Markham*, *Ransonnet*, *Mus. Vindob.*), Potrero (*Hedemann*), Oaxaca (*Fenocchio*), Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*), Rio Hondo (*Blancaneaux*); GUATEMALA, Pacific coast, Retalhuleu, Yzabal, Motagua valley, and Polochic valley (*F. D. G. & O. S.*), Zapote and Panima (*Champion*); HONDURAS, San Pedro (*G. M. Whitely*); NICARAGUA³ (*Bridges*), Chontales (*Belt*); COSTA RICA (*Van Patten*^{2 8}), Cache (*Rogers*); PANAMA, Volcan de Chiriqui, 2000 to 3000 feet (*Champion*), Bugaba, Calobre (*Arcé*), Lion-Hill station (*M^cLeannan*), Colon (*Markham*).—COLOMBIA; ECUADOR.

Some difficulty presents itself as to the proper name to adopt for this *Heliconius*; but there can, we think, be no doubt that the titles *petiveranus* and *demophoon* were both intended for the same insect. The former is based upon an old figure in Petiver's 'Gazophylax.' That this was meant to represent this species there can, we think, be little doubt; but it would have been much more satisfactory had Doubleday, when introducing the name *H. petiveranus*, described the species instead of merely referring to this figure. This seems to have been the opinion of Ménétrié, who went so far as to propose a name of his own to supersede that of Doubleday³. In so doing he has been followed by several writers. We prefer, however, to use the name *H. petiveranus*, believing as we do that no uncertainty is incurred thereby. The insect described by Boisduval as *H. rosina*⁷, though admitted as distinct by Messrs. Butler and Druce⁸, has, in our opinion, no right to such distinction. We find in many places specimens in which the yellow band of the secondaries beneath does not quite reach the outer margin; but this character, by which alone *H. rosina* seems separable, we do not consider of specific value. With regard to *H. amaryllis*, Feld., we are not so certain, as our series of southern specimens is not sufficiently extensive to enable us to form a decided opinion. We notice, however, that variation occurs in the number of red spots at the base of the secondaries, rendering the position of *H. amaryllis* doubtful; and, moreover, we hesitate to admit the existence of two forms in Costa Rica, which is Mr. Distant's opinion⁹.

On the whole *H. petiveranus* is fairly constant in its markings; but the more northern specimens have the yellow band of the secondaries very narrow, but do not otherwise differ.

This species is quite characteristic of the hot regions of Central America, being always to be seen in the forest-paths of the tierra caliente. It is never to be met with in the temperate region, its home lying between an elevation of about 2000 feet and the sea-level. In such localities we found it everywhere in Guatemala.

The nearest allies to *H. petiveranus* are *H. phyllis* and *H. beskii*, both of South-eastern Brazil. In Guiana and the Amazons valley no allied species is found.

17. *Heliconius melpomene*.

Papilio melpomene, Linn. Mus. Ludov. Ulr. p. 232¹; Cr. Pap. Ex. t. 191. f. C².

Heliconius melpomene, Bates, Trans. L. S. xxiii. p. 557³.

Alis fusco-nigris, anticis fascia irregulari lata transversa per cellulæ finem coccinea; subtus dilutioribus, punctis ad basin coccineis, posticis costa flavo notata.

Hab. NICARAGUA, Greytown (*Muncaster*); PANAMA, Santa Fé and Calobre (*Arcé*), Lion-Hill station (*M^cLeannan*).—NORTH COLOMBIA; VENEZUELA; GUIANA²; AMAZONS, Obydos and Santarem³; NORTH BRAZIL, Maranham.

Linnaeus's description¹ seems to apply to this species; and Cramer's figure² certainly does; but the plates referred to by the former do not support his description, that in Edwards's 'Natural History of Birds,' t. 38, representing one of the forms of *A. melpomene* with red at the base of the primaries, and that in Sloane's 'History of Jamaica' being of very doubtful application. The name *H. melpomene*, however, has now a well-established meaning, and we use it in the same sense as Cramer and Mr. Bates. It is a butterfly of wide range throughout the northern parts of South America, and passes into Central America as far as the port of Greytown in Nicaragua. Except that the average size of Central-American specimens is rather small, we see no difference between them and Southern examples. In all the shape of the red spots of the primaries is very variable. In Colombia an allied form with a blue gloss on the wings has been described by Mr. Reakirt as *H. guarica**; but this has not yet been certainly found in Central America, though Boisduval includes it under the name *H. euryas*†. In Western Colombia, too, a species somewhat intermediate in its markings between *H. melpomene* and *H. petiveranus* occurs, which Mr. Butler described under the name *H. vulcanus*‡, giving Panama as its habitat. We believe, however, that it, in fact, hardly occurs within our limits, but just beyond them; for from San Buenaventura on the west coast of Colombia we have specimens supplied us by Dr. Staudinger, the species being unknown to our collectors on the isthmus itself.

* Pr. Ac. Phil. 1868, p. 91.

† Léop. Guat. p. 29.

‡ P. Z. S. 1865, p. 433.

e'. Wings blue-black, with a white or yellow band across the primaries, sometimes with secondaries margined with white or yellow.

18. **Heliconius galanthus.** (Tab. XVIII. figg. 1, 2.)

Heliconius galanthus, Bates, Ent. Monthl. Mag. i. p. 58¹; Butl. & Druce, P. Z. S. 1874, p. 351².

Heliconia diotrepes, Hew. Trans. Ent. Soc. 1869, p. 33³.

Alis chalybeio-indigoticis, anticis in medio late albis et venis divisis fere dimidium alæ occupante, macula disco-cellulari ad costam conjuncta nigra, apicibus coloris ejusdem; posticis ad apicem punctis variis albis notatis; subtus dilutioribus, posticis fuscis, costa (nisi basin versus) et linea plus minusve ovata in area discali rufis, posticis (interdum quoque anticis) punctis albis marginatis, costa ad basin flavescente.

Hab. BRITISH HONDURAS, Rio Hondo (*Blancaneaux*); GUATEMALA, Choctum, Motagua valley (*F. D. G. & O. S.*¹), Polochic valley (*Hague*), Cubilguitz, Sabo, Senahu, and San Juan (*Champion*); NICARAGUA, Chontales³ (*Belt, Janson*), Greytown (*Muncaster*); COSTA RICA (*Van Patten*²), Volcan de Irazu and Cache (*Rogers*).—W. COLOMBIA.

Mr. Bates's description of this species was based upon specimens obtained by us in the forests of Eastern Guatemala in 1862, where it has since been found in various places by Mr. Hague's collectors, and more recently by Mr. Champion. It also appears to be by no means an uncommon butterfly in the district of Chontales in Nicaragua and in Costa Rica; but in the State of Panama its place seems to be taken by an allied species (*H. chioneus*), which differs in having a broad white submarginal border to the secondaries. Curiously enough a species so closely resembling *H. galanthus* that we hesitate to separate it, reappears in Western Colombia in the neighbourhood of San Buenaventura.

The Nicaraguan insect was separated by Hewitson³ under the name of *H. diotrepes*, on account of the presence of a submarginal row of white spots near the apex of the primaries beneath, and the secondaries being distinguished by having the base of the costa yellow. Neither of these characters is peculiar to the Nicaraguan butterfly, as both are to be traced in some specimens in the Guatemalan form, though with less distinctness. In the Colombian race these characters are much more strongly impressed; and did they show more stability it would be necessary to give this insect a separate name. As it is, we prefer to treat them all under the title *H. galanthus*, and the species as one of wide range.

Heliconius galanthus is found in the same forests as *H. leuce*, just as *H. chioneus* is found with *H. sappho*, the main difference between the associated species being in the coloration of the underside of the secondaries—*H. galanthus* and *H. chioneus* having russet streaks across, *H. leuce* and *H. sappho* red spots at the base of these wings. In the northern parts of South America we find several other species paired, as it were, in this singular way. In Colombia we find *H. cydno* of the *H. galanthus* form with *H. eleuchia* of the *H. leuce* form, and again in Ecuador *H. alithea* of the

former with *H. primularis* of the latter. We see no way at present of accounting for this singular state of things.

Of the present species we have figured one of the type specimens, a male from Choctum in Northern Vera Paz, Guatemala.

19. *Heliconius chioneus*. (Tab. XVIII. figg. 7, 8.)

Heliconius chioneus, Bates, Ent. Monthl. Mag. i. p. 58¹.

H. galantho similis, sed litura alba anticarum angustiore, posticis albo marginatis (venis divis); subtus ut supra, sed posticis rufo notatis fere ut in *H. galantho*.

Hab. PANAMA, Chiriqui, Santa Fé and Calobre (*Arcé*), Lion-Hill station (*M'Leannan*¹).
—COLOMBIA, Frontino.

A single example, which we now figure, was the type of Mr. Bates's description of this species. This was sent us by the late James M'Leannan from his station on the Panama railway. He subsequently sent us a few other examples; but the species does not appear to be so abundant on the line of railway as further to the westward in the State of Panama, whence we have received a good supply of specimens. In this direction it spreads as far as the neighbourhood of Chiriqui; but in Costa Rica its place is taken by *H. galanthus*. In Colombia it occurs near Frontino in the Cauca valley.

There is some slight variation in members of this species, chiefly affecting the inner margin of the white band of the primaries. The submarginal band, too, of the secondaries is nearer the margin in some specimens than in others; but in all it is a feature by which they may at a glance be distinguished from *H. galanthus*.

Note.—The Colombian *Heliconius cydno* is included by Messrs. Butler and Druce* in their list of Dr. Van Patten's Costa-Rica collection, on the faith of a single specimen contained in it. In default of further evidence of the occurrence of the species within our limits, we are inclined to think that this specimen had been accidentally introduced into the collection from another source, as seems to have happened in other instances.

20. *Heliconius leuce*. (Tab. XVIII. figg. 3, 4.)

Heliconia luce, Doubl. Gen. Diurn. Lep. p. 102¹.

Ajantis sappho, Hübn. Zutr. ex. Schmett. iii. p. 36, figs. 565, 566 (nec Drury).

H. galantho similis, sed margine externo fascia alba anticarum profundo dentato, subtus posticis fuscis, punctis variis coccineis ad basin notatis.

Hab. BRITISH HONDURAS, river Sarstoon (*Blancaneaux*); GUATEMALA, Yzabal, Motagua valley, and forests of Northern Vera Paz (*F. D. G. & O. S.*), Polochic valley (*Hague*), Cubilguitz, Panima, Teleman, and Panzos (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Endres*).

* P. Z. S. 1874, p. 351.

This *Heliconius* was first recognized by Hübner, who gave an excellent figure of it in his 'Zuträge zur Sammlung exotischer Schmetterlinge' in 1825. Unfortunately he thought it belonged to the same species as that described by Drury as *Papilio sappho*, a mistake subsequently rectified by Doubleday, who gave it the name it now bears. Both Hübner and Doubleday, however, put it down as a species of Brazil, which is no doubt erroneous, as we have no recent evidence of its occurring outside the limits of Central America. Here, as will be seen above, it occurs throughout a wide extent of country from Guatemala to Costa Rica. In the latter country it is rare, but not so in the former, as we have both taken it ourselves and received many specimens, all from the eastern forests of that country.

It is strictly a forest-haunting species, being found from the sea-level to a height of about 1500 feet above it.

We have figured a female specimen from the valley of the Polochic, Guatemala.

21. *Heliconius sappho*. (Tab. XVIII. figg. 5, 6.)

Papilio sappho, Drury, Ill. Nat. Hist. iii. p. 53, t. 38. f. 4¹.

H. leuce similis, sed fascia alba anticarum angustiore et margine ejus externo fere recto, posticis albo marginatis (venis divis); subtus ut supra, maculis basalibus coccineis majoribus.

Hab. PANAMA, Santa Fé (*Arcé*).

Drury, who first described this species, figured it on the same plate with three others, all of which, together with the present insect, are now known to inhabit the Isthmus of Panama, whence doubtless the original specimens were first taken to Jamaica, before they passed into Drury's possession, who put them down as inhabitants of the island, instead of the continent. This mistake has been transmitted to the present time in published works, though we have long ascertained the true patria of the species, having received specimens direct from the State of Panama from one of our most active collectors. In Panama it would appear to be a scarce insect, as Santa Fé is the only locality we are able to record where it is found. It probably has a wider range within the State—one perhaps, judging from analogy, coinciding with that of *H. chioneus*, its companion species.

We have figured a male from Santa Fé.

22. *Heliconius theudela*. (Tab. XVIII. figg. 9, 10.)

Heliconia theudela, Hew. Ent. Monthl. Mag. x. p. 224¹.

Alis ehalysbeo-nigris, anticis fasciis duabus obliquis venis divis, flavis, posticis maculis ovatis flavis marginatis; subtus dilutioribus, ad basin punctis minutis variis coccineis ornatis.

Hab. PANAMA¹, Chiriqui (fide *Staudinger*), Veraguas (*Arcé*).

Of this scarce species but few specimens have come under our notice. These have mostly passed through Dr. Staudinger's hands, whence probably Hewitson's type was

also derived. One specimen was forwarded to us by Arcé from the neighbourhood of Santiago de Veraguas; and this we have now figured.

H. theudela has no very near allies in the genus, but partakes of the characters of two groups: the yellow submarginal band of the secondaries suggests an alliance with *H. eleuchia*, whilst the two yellow bands of the primaries recall *H. rhea* and its allies.

23. *Heliconius pachinus*. (Tab. XVIII. fig. 11.)

Heliconius pachinus, Salv. Ann. & Mag. Nat. Hist. ser. 4, vii. p. 414¹; Butl. & Druce, P. Z. S. 1874, p. 351²; Staudinger, Verh. z.-b. Ges. Wien, 1875, p. 98³; Hew. Ex. Butt., Hel. t. 8. f. 26⁴.

Alis chalybeio-nigris, anticis fasciis duabus ultra cellulam, posticis una aream mediam transeunte, omnibus venis divisis, flavis; subtus ut supra, sed dilutioribus, anticis costa ad basin, posticis margine anteriore et maculis basalibus rubro pictis.

Hab. COSTA RICA (*Van Patten*²); PANAMA, Volcan de Chiriqui (*Arcé*¹, *Zahn*, *Champion*, *Ribbe*³).

The vicinity of the volcano of Chiriqui seems to be the headquarters of this remarkable species, and where it is very common, as would appear from the plentiful supply of specimens that are to be found in all collections made in that district. It is, however, extremely local; a single specimen from Costa Rica was in Dr. van Patten's collection, and is the only one we have seen from that country; nor does it appear to be found in any other part of the State of Panama, except Chiriqui.

In having two yellow bands to the primaries and red spots at the base of the secondaries beneath, *H. pachinus* recalls the South-American *H. aranea* and its allies; but the well-defined yellow band on the secondaries at once distinguishes it from all of these.

We have figured a male from Chiriqui, one of the type specimens.

24. *Heliconius hewitsoni*.

Heliconius hewitsoni, Staudinger, Verh. z.-b. Ges. Wien, 1875, p. 98¹; Hew. Ex. Butt., Hel. t. 8. f. 26².

H. pachino persimilis, sed fascia intima flava anticarum per cellulæ finem (nec ultra eam) transeunte distinguendus.

Hab. PANAMA, Volcan de Chiriqui² (*Ribbe*¹).

We have not yet received specimens of this *Heliconius*, which is a close ally of *H. pachinus*, as will be seen by reference to Hewitson's plate². According to Dr. Staudinger¹ (who derived his information from Herr Ribbe, the discoverer and sole collector of the few specimens that have reached Europe), *H. hewitsoni* is found in the higher parts of the volcano of Chiriqui, taking the place, at an elevation of 6000 feet, of *H. pachinus*, which occurs at a lower level.

f'. Wings blue-black, a yellow or white patch on the primaries.

25. **Heliconius magdalena.** (Tab. XVIII. fig. 13.)

Heliconius magdalena, Bates, Ent. Monthl. Mag. i. p. 57¹.

Heliconius rhea, Butl. & Druce, P. Z. S. 1874, p. 351².

Heliconius sara, Dist. Pr. Ent. Soc. 1876, p. xiii.³

Alis chalybeio-nigris, anticis fascia obliqua per cellulæ finem flava, altera angustiore apicem versus; subtus dilutioribus, punctis ad basin coccineis.

Hab. NICARAGUA (*Bridges*), Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*², *Endres*), Talamanca (*Gabb*³); PANAMA, Bugaba and Veraguas (*Arcé*), Lion-Hill station (*McLeannan*).—COLOMBIA¹; ECUADOR; VENEZUELA.

This species represents the Guianan *H. rhea* and the Brazilian *H. apseudes* in the north-western portions of South America, penetrating into Central America as far as Nicaragua. It is distinguished, as Mr. Bates has pointed out, by having both the yellow belts of the primaries linear and narrow instead of the inner one being oval. The fringe of the secondaries, too, is more conspicuous in *H. magdalena*.

In the State of Panama this species is common, and almost equally so throughout its Central-American range; we have also many southern specimens all keeping their distinctive features. In Guatemala it is replaced by *H. veræpacis*.

We have figured a typical specimen from Panama.

26. **Heliconius veræpacis.** (Tab. XVIII. fig. 12.)

Heliconius veræpacis, Bates, Ent. Monthl. Mag. i. p. 57¹.

H. magdalene similis, sed alis paulo dilutioribus et fascia interiore anticarum latiore et pallidior.

Hab. GUATEMALA, forests of Northern Vera Paz (*F. D. G. & O. S.*), Polochic valley (*Hague*).

This is also a close ally of *H. rhea* and of *H. magdalena*. The spots of the primaries are paler than those of any of the allied species; and the inner one, though broader than that of *H. magdalena*, is more quadrate than that of *H. rhea*, with the margin more irregular. All the specimens we have are constant in these differences; so that the race seems fairly established.

Guatemala is the only country from which we have yet obtained specimens. We first discovered it in the low-lying forests of Northern Vera Paz, at about 1200 feet above the sea, in February of the year 1862. Since then Mr. Hague has sent us a few examples from the Polochic valley; but it is decidedly a much rarer species than its ally *H. magdalena* is in its own country, and has a much more restricted range.

We have figured one of the types.

- b.* Femur of front leg of the male not longer than the coxa; tibia and tarsus short; body stout, not projecting beyond the anal angle of the secondaries.

27. *Heliconius erato*.

Papilio erato, Linn. Mus. Lud. Ulr. p. 231¹ (ex Clerk, Ic. Ins. t. 40. f. 1).

Heliconius erato, Bates, Trans. Linn. Soc. xxiii. p. 557²; P. Z. S. 1863, p. 248³; Butl. & Druce, P. Z. S. 1874, p. 351⁴.

Papilio doris, Linn. Mant. p. 536⁵; Cr. Pap. Ex. iv. p. 92, t. 337. f. C⁶.

Heliconia doris, Boisd. Léop. Guat. p. 29⁷.

Papilio amathusia, Cr. Pap. Ex. ii. p. 124, t. 177. f. F⁸.

Heliconia thetis, Boisd. Léop. Guat. p. 29⁹.

Papilio quirina, Cr. Pap. Ex. i. p. 101, t. 65. f. A, B¹⁰.

Nereis festiva delila, Hübn. Samml. ex Schmctt. i. t. 13¹¹.

Alis nigris, anticis macula irregulari ad cellulæ finem (venis divis) flava, altera angustiore apicem versus, posticis area basali rubra (nennunquam cærulea aut viridi) marginem externum versus radiante et punctis minutis submarginalibus albis; subtus ut supra, sed lineis albescentibus radiantibus marginem exteriorum versus, maculisque variis coccineis ad basin ornatis.

Hab. BRITISH HONDURAS, river Sarstoon (*Blancaneaux*); GUATEMALA, Yzabal, forests of Northern Vera Paz, Motagua valley (*F. D. G. & O. S.*), Polochic and Chisoy valleys (*Hague*), Cubilguitz, Panima, and Teleman (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*⁴), Volcan de Irazu, Cache (*Rogers*); PANAMA, Chiriqui (*Zahn*), Volcan de Chiriqui, 2000 to 3000 feet (*Champion*), Calobre (*Arcé*), Lion-Hill station (*M. Leannan*^{6 8 10}).—COLOMBIA; VENEZUELA; GUIANA³; AMAZONS valley²; N. BRAZIL.

A remarkable species, on account of the polymorphism of individuals, which represent at least four styles of coloration. In one the base of the secondaries is red, in another blue, and in another green, the fourth having the spots of the primaries white instead of yellow. Different as these colours are, but slight evidence can be traced of the existence of any intermediate forms; some specimens, however, with a red base to the secondaries have in their deeply indentated margin a narrow blue or green border. Such a specimen is figured by Cramer under the name *P. amathusia*⁸. These differences are quite independent of sex and, for the most part, of locality, Mr. Bates having reared both the red and the blue forms from larvæ which fed on the same tree². The older authors not unnaturally considered them distinct species. Linnæus himself gave them two names. *H. erato* was first applied to the red-winged form represented by Clerk¹ and also, with his usual accuracy, by Hübner¹¹. Linnæus's second name was given to the blue-winged form subsequently figured by Cramer as *P. quirina*¹⁰. The green-winged form, which is scarcer than the others, has apparently not been described; but that with white-spotted primaries Cramer figured as *P. doris*⁶.

In Central America the three first-mentioned forms occur; but in the case of the red-winged form the base of the primaries is usually black, though traces of red are not

wanting. This race Boisduval described as *H. thetis*⁹, but, in our opinion, on an insufficient and unstable character.

In Guatemala we found *H. erato* most abundant in the virgin forests of Northern Vera Paz, where the red- and the blue-winged forms were commonest, and flew quite indiscriminately in the forest paths. Respecting the distribution of the differently coloured members of this species, Mr. Bates's observations are of great interest; for after enumerating various localities where the blue- and the red-winged forms fly together, he goes on to say that at St. Paulo, on the Upper Amazons, the blue-winged form alone was found in profusion, to the exclusion of the other².

H. erato has only one near ally in *H. metharme*, which is a not uncommon insect at Ega and St. Paulo; but from this it differs in many points².

EUEIDES.

Eueides, Hübner, Verz. bek. Schmett. p. 11 (1816); Doubleday, Gen. Diurn. Lep. p. 145.

This genus was placed by Doubleday as the head of his family Nymphalidæ; but in his description of its characters he alludes to the many points of resemblance it bears to *Heliconius*, the chief difference being the clavate antennæ.

Mr. Bates subsequently* associated *Eueides* with *Heliconius* in his Acræoid Heliconidæ, removing it altogether from the Nymphalinæ. This association seems to have since been pretty generally adopted, and *Eueides* placed next to *Heliconius* in the sub-family Heliconinæ.

Whether we look at the structure of the front pair of legs, the neururation of the secondaries, the general shape of the wings, or to the secondary sexual characters of the male, the resemblance of *Eueides* to *Heliconius* is evident.

Regarding the secondary sexual male organs the same complicated character observable in *Heliconius* can be traced, and the main outlines of the various parts seem to be very similar; but the difficulty in interpreting their meaning from an examination of specimens that have been dried is great and the result not always satisfactory. The tegumen has a similar stirrup-like piece inside its cavity as in *Heliconius*; the harpagones are of similar form, having what appears to be a membranous envelope; the penis, too, is very short.

The obvious point of distinction between the two genera rests almost entirely with the antennæ, which in *Eueides* are distinctly clubbed, and in *Heliconius* gradually thickened towards the distal end.

Some twenty-four species of this genus are now known. These are spread over nearly the whole of Tropical America, some being also found in the larger Antilles, such as Cuba and St. Domingo. In Mexico and Central America we now know of seven species, five of which are peculiar to the region. Two of these are found in Mexico (none

* Trans. Linn. Soc. xxiii. p. 496.

penetrating to the United States); Guatemala has four species; and the rest are found in the southern portions of the country.

All are inhabitants of the warmer districts, 3000 feet being about the limit of their range in altitude.

1. *Eueides vibilia*.

Cethosia vibilia, Godt. Enc. Méth. ix. p. 245¹.

Colenis vibilia, Hübn. Zutr. ex. Schmett. iii. p. 16, ff. 449, 450².

Eueides vibilia, Butl. & Druce, P. Z. S. 1874, p. 350³.

Eueides pavana, Ménétr. Cat. Mus. Pctr. Lep. t. viii. f. 4⁴.

Alis anticis fuscis, macula a basi ad ramum medianum primum fulva, fascia obliqua venis late divisa ad cellulæ finem alteraque apicem propiore flavo-fulvis; posticis fulvis, venis omnibus et margine externo nigris; subtus ut supra, sed alis dilutioribus et punctis marginalibus albis ornatis.

Hab. GUATEMALA, Polochic valley (*Hague*); COSTA RICA (*van Patten*³).—BRAZIL^{1 2 4}.

This species was first described by Godart from Brazilian specimens, from which country we have also obtained it. We have no knowledge of its occurrence northward of this till we reach Costa Rica, whence we have received several examples differing in no material respect from our insects from Rio Janciro; but there is a certain amount of variation in individuals from the same locality, no two being exactly alike. We have one from Costa Rica which has the mark at the base of the primaries and the whole of the interior area of the secondaries dark ferruginous, the latter not being divided by black nervules till close to the outer margin. We have also a single Guatemalan specimen sent by Mr. Hague from the Polochic valley; in this all the fulvous markings are orange, but the black veining of the secondaries is strongly shown. These, however, are extreme cases; and we are unable to point out constant differences whereby the northern insects can be separated from the southern.

The distribution of *E. vibilia* is one of the many instances we have to bring forward of the close connexion of the Central-American and Brazilian faunas, these widely distant countries being occupied by allied and even, as in this case, by the same species, the intervening tract of land being devoid of them.

2. *Eueides vulgiformis*. (Tab. XIX. fig. 3.)

Eueides vulgiformis, Butl. & Druce, Cist. Ent. i. p. 102¹; P. Z. S. 1874, p. 351².

Alis anticis nigris, macula ad cellulæ finem, duabus infra, fascia maculosa subapicali punctisque aliis ad apicem ipsum cervinis; posticis ferrugineis nigro marginatis et puncto albo ad apicem notatis; subtus dilutioribus, alis ambabus punctis submarginalibus albis serie ornatis.

Hab. COSTA RICA (*van Patten*^{1 2}), Irazu, Cache, and Rio Sucio (*Rogers*); PANAMA, Volcan de Chiriqui (*Zahn*).

This insect was brought to light by van Patten, and described by Messrs. Butler and Druce in their paper on the Butterflies of Costa Rica¹. It appears to have a very

restricted range, since we have only met with it in Costa-Rican and Chiriqui collections. It is closely allied to *E. edias* of Hewitson, of which it is a darker form. The spots on the primaries are smaller, and the black much more intense; the secondaries also are more ferruginous.

The pattern of the wings of *E. vulgiformis* is repeated in *Heliconius formosus*, in *Eresia nigripennis*, and in *Ithomeis imitatrix*, all of which inhabit the same country. Several species of *Ithomia* and its allies also partake of very much the same style of coloration.

3. *Eueides aliphera*.

Cethosia aliphera, Godt. Enc. Méth. ix. p. 246¹.

Colænis aliphera, Hübn. Samml. ex. Schmett. ii. t. 21².

Eueides aliphera, Bates, Trans. L. S. xxiii. p. 564³.

Alis fulvis, anticis costa, marginibus, fascia obliqua a cellulæ fine ad marginem externum eunte alteraque in area submediana anguste nigris; posticis nigro marginatis ramisque margines attingentibus nigris, subtus dilutioribus.

Hab. MEXICO, Cordova (*Rümeli*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, forests of Northern Vera Paz, San Gerónimo, Polochic valley, Retalhuleu (*F. D. G. & O. S.*), San Juan in Vera Paz (*Champion*); NICARAGUA, Chontales (*Belt & Janson*); COSTA RICA (*van Patten*), Irazu (*Rogers*); PANAMA, Chiriqui and Calobre (*Arcé*), Lion-Hill station (*M^cLeannan*).—COLOMBIA, and South America generally to BRAZIL^{1 3}.

A very widely ranging species, and probably one of the most common, as few collections made anywhere between Mexico and Brazil are without it. There is a certain amount of individual variation in different specimens as to the width of the black margins of the wings, and also as to the depth of the fulvous colouring; but this does not appear to have much reference to locality. In shape the present species differs from all others of the genus in having the wings narrower, the apex of the primaries more straight instead of rounded, and their external margin hollowed out.

In Guatemala we found it an abundant species in scrubby forest up to an elevation of 3000 feet at San Gerónimo.

In the pattern of its wings *E. aliphera* closely resembles *Colænis delila*; but it is only half the size of that butterfly. *C. delila* in its various races is an equally abundant and widely distributed species.

4. *Eueides lineata*. (Tab. XIX. fig. 2.)

Eueides lineata, Salv. & Godm. Ann. & Mag. N. H. ser. 4, ii. p. 145¹; Butl. & Druce, P. Z. S. 1874, p. 350².

E. alipheræ similis, sed alis magis ferrugineis et latius nigro notatis, nervulis marginem versus nigris; subtus posticis punctis albis marginatis.

Hab. GUATEMALA, Polochic valley and Chuacus (*Hague*¹), Senahu, Panima (*Champion*); COSTA RICA (*van Patten*²), Rio Sucio (*Rogers*).

We described this species from examples sent us by Mr. Hague from Guatemala; since then we have likewise received it from Costa Rica. It is very similar to *E. aliphera*, but is rather larger, with the apex of the primaries more rounded, the tawny colour darker, and the black markings much stronger, the secondaries beneath have a row of white spots on the margin, which is not present in *E. aliphera*. As far as we know, it is confined to the localities indicated above.

The specimen figured is one of the types from Guatemala.

5. *Eueides lybioides*.

Eueides lybioides, Staudinger, Verh. z.-b. Ges. Wien, 1875, p. 99¹.

Alis anticis fuscis, fascia arcuata a basi per aream mediam fere ad marginem externum eunte, et macula obliqua apicem propiore fulvis, posticis nigro marginatis.

Hab. PANAMA, Chiriqui (*Ribbé*¹, *Arcé*).

This species was described by Dr. Staudinger, who pointed out how it differed from its very close ally *E. lybia*. These differences, though slight, are constant in all our specimens; and *E. lybioides* appears to constitute a distinct race. On the upperside the subapical tawny spot of the primaries is paler than in *E. lybia*. Beneath, the whole surface is also somewhat paler; and this is especially the case with the subapical spot, which is of a dirty yellow. There is also a faint yellow additional spot at the apex of the primaries; and the black margin of the secondaries is divided by a similarly coloured streak. The base of the costa of the primaries beneath in *E. lybia* is red, but not so in *E. lybioides*.

The range of *E. lybia* extends throughout Guiana and the Amazons basin to Peru, whilst that of *E. lybioides* is confined to the State of Panama.

6. *Eueides olympia*. (Tab. XIX. fig. 1.)

Papilio olympia, Fabr. Ent. Syst. iii. p. 166¹.

Eueides olympia, Butl. Cat. Fabr. Diurn. Lep. p. 120².

Eueides leucomma, Bates, Ent. Monthl. Mag. iii. p. 88³.

E. lybioidi similis, sed macula anticarum prope apicem alba distinguenda.

Hab. NICARAGUA, Chontales (*Belt*, *Janson*); PANAMA, Santa Fé (*Arcé*), Lion-Hill station (*M'Leannan*³).—W. COLOMBIA.

Mr. Bates described this insect, under the name of *E. leucomma*, from specimens he received from us captured by M'Leannan on the Panama Railway. There can, however, be no doubt that Fabricius's *Papilio olympia* refers to this species, as Mr. Butler has pointed out²; and therefore the latter name, having priority, must be used. *E. olympia* is very like *E. lybioides*, but may be distinguished from it at a glance by its

having the subapical spot on the primaries of a pure white instead of dirty yellow. It appears to have a wider range than *E. lybioides*, being apparently found from Nicaragua to Panama and southwards to the neighbourhood of San Buenaventura in Western Colombia; but as yet we have not seen any specimens from Costa Rica, though it can hardly fail to be found there in suitable localities.

We have figured a specimen from Lion-Hill, Panama, one of the types of *E. leucomma*.

7. *Eueides zorcaon*.

Eueides zorcaon, Reakirt, Proc. Ac. Phil. 1866, p. 243¹.

Eueides anaxa, Ménétr. Cat. Mus. Petr., Lep. pp. 21, 115² (ex Boisduval).

Eueides cleobæa, Butl. & Druce, P. Z. S. 1874, p. 351³ (nec Hübner).

Alis nigris, anticis fascia arcuata a basi ad marginem externum inter ramum medianum primum et secundum cunte, altera infra eam in margine interno, maculis duabus elongatis, una ad cellulæ finem, altera infra eam, fasciæque maculosa subapicali, omnibus fulvis (in dimidio distali nonnunquam flavis); posticis fasciis duabus per alam transeuntibus, margine externo nigro, angulum analem versus albo punctato; subtus alis fere ut supra, sed dilutioribus et duplici serie punctorum alborum in margine externo ornatis.

Hab. MEXICO (*Sallé*), near Vera Cruz (*W. H. Edwards*¹), Cordova (*Rümeli*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA¹, Polochic valley (*F. D. G. & O. S.*); HONDURAS¹; NICARAGUA², Chontales (*Janson*); COSTA RICA (*van Patten*³), Irazu, Cache, and Rio Susio (*Rogers*); PANAMA, Calobre (*Arcé*), Lion-Hill station (*MacLeannan*).

Mr. Kirby has placed *E. zorcaon* as a synonym of *E. cleobæa* of Hübner; but Mr. Reakirt has pointed out that his species differs from Hübner's. This difference is no more than we might expect, as the former is found in Central America, while the locality given for the latter is Cuba. Unfortunately we have no Cuban examples in our collection: but no specimen in our series exactly agrees with Hübner's figure; hence we conclude with Reakirt that *E. cleobæa* is a distinct race. In the series before us there is no material variation in the pattern. *E. zorcaon* is very closely allied to *E. dynastes*, Feld., which inhabits Venezuela, Colombia, and Ecuador; but, besides other minor differences, it may at once be distinguished from *E. dynastes* by having a double row of white marginal spots on the underside of the secondaries. The colouring of the spots on the apical half of the primaries varies in different individuals, though, as before remarked, the pattern is the same: in some these spots are bright yellow; and in others they pass from that to the dark tawny colour of the basal portion of the wing. These differences do not seem to be associated with special localities.

The colour-pattern of the wings of *E. zorcaon* is much that of *Lycorea atergatis*, *Heliconius telchinia*, *Eresia mechanitis*, and other species, all occurring in some common locality.

Subfam. *NYMPHALINÆ* *.

METAMORPHA.

Metamorpha, Hübner, Verz. bek. Schmett. p. 43 (1816).

Colænis, Section III., Doubleday, Gen. Diurn. Lep. p. 149.

The butterfly usually known as *Colænis dido* presents so many differences from the species with which it is usually placed that we think it ought to be regarded as belonging to a distinct genus. To this Hübner's name *Metamorpha* may be applied, a title originally proposed for *M. dido* and two other species having a slight colour-resemblance to it, viz. the species now known as *Victorina steneles* and *V. sulpitia*. These latter we now remove from this association, and reserve *Metamorpha* for *M. dido* alone.

As already pointed out by Doubleday, the first subcostal nervure is thrown off before the end of the cell. The tarsi of the front legs of the male are very short, being not more than one third the length of the tibia; and both femur and tibia are rather stout. Besides these characters, the secondary sexual organs of the male present peculiarities. The harpagones are bilobed, with a long recurved hook on the lower lobe on each side, the upper lobe being blunt. The tegumen is much as in *Heliconius*, with two points, an upper decurved and a lower recurved one. This latter portion of these organs is very similar in true *Colænis* as now restricted.

At present, so far as we know, *M. dido* is the sole representative of this form, a common tropical American insect having a wide range, as given below.

1. *Metamorpha dido*.

Papilio dido, Linn. Syst. Nat. i. p. 782¹; Cram. Pap. Exot. t. 196. f. E, F².

Metamorpha dido, Hübner, Verz. bek. Schmett. p. 43³.

Colænis dido, Bates, Journ. Ent. ii. p. 186⁴.

Alis nigris viridi maculatis; subtus ut supra, sed colore nigro paginæ superioris rubiginoso argenteo tincto.

Hab. NICARAGUA, Chontales (*Belt, Janson*); PANAMA, Lion Hill (*McLeannan*).—SOUTH AMERICA, from Colombia to Brazil.

This is a very peculiar insect, both in its style of marking and coloration, differing widely in these respects from all other species of the genus with which it has hitherto been associated. It has an extensive range, being distributed generally throughout

* As already stated (*anteà*, p. 113), we omit the subfamily *Morphinæ* from Mr. Bates's *Nymphalinæ* (Journ. Ent. ii. p. 177); but in other respects we treat this group of Butterflies as he has done, and we also follow him in the consecutive arrangement of the genera. As to the classification of the subfamily itself, we regret that we are obliged to relinquish any attempt to do more than follow in the old lines. As Mr. Bates well observes, any satisfactory subdivision of the *Nymphalinæ* must necessarily involve an examination of the representatives of these butterflies wherever they are found throughout the whole world; and as they are everywhere numerous both in genera and species, such a task is far beyond the scope of our present work.

tropical South America; we have, however, no trustworthy record of it in our country to the north of Nicaragua, where both Belt and Janson met with it. Doubleday, however, gives it from Honduras with doubt, a statement requiring confirmation. The older authors received their specimens from Surinam^{1 2}, where, according to Madam Merian, the caterpillar feeds on the fruit of the pine. Mr. Bates speaks of it as a conspicuous object in all semicultivated places near settlements on the banks of the Amazons⁴.

COLÆNIS.

Colænis, Hübner, Verz. bek. Schmett. p. 31 (1816).

Colænis, Section I., Doubleday, Gen. Diurn. Lep. p. 143.

In *Colænis*, as here restricted, we continue to associate *C. julia* and its allies, which must be regarded as the typical species of the genus, and *C. phærusa*, an aberrant form so far as regards the characters of the secondary sexual male organs. In *C. julia* the harpagones are unilobed, the distal margin being rounded and without hooks or prominences. In *C. phærusa* they are bilobed, the upper lobes being two distinct decurved hooks, the lower lobes being blunt. Regarding the structure of the front legs of the males no material differences are to be traced: the femur, tibia, and tarsus are all slender; and the tarsus is about half the length of the tibia instead of one third as in *Metamorpha dido*. The subcostal branch of the primaries is thrown off beyond the cell in *C. julia*, instead of before it as in *M. dido*. Should it prove necessary to separate *C. phærusa* from *C. julia* and its allies, Hübner's name *Pantoporia* may be used for the former.

Colænis is also a tropical American genus just reaching Texas, and well represented in the larger Antilles by races allied to *C. julia*. About eight species are known.

1. *Colænis phærusa*.

Papilio phærusa, Linn. Mus. Ulr. p. 293¹; Syst. Nat. i. p. 780².

Papilio phætusa, Cram. Pap. Ex. t. 130. f. B, C³.

Colænis phærusa, Doubl. Gen. Diurn. Lep. p. 149⁴; Bates, Journ. Ent. ii. p. 186⁵; Butl. & Druce, P. Z. S. 1874, p. 350⁶.

♂. Alis fulvis, anticis fasciis tribus atris obliquis, posticis transversis, his maculis minutis submarginalibus fulvis aut flavis notatis; subtus ut supra, sed anticis fascia subapicali et posticis fasciis omnibus citrinis fulvo marginatis, his costa maculisque submarginalibus flavis.

♀. Mari similis, sed omnibus alarum coloribus dilutioribus.

Hab. MEXICO, Cordova (*Rümeli*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA⁵, Polochic valley, Chilasco (*F. D. G. & O. S.*); HONDURAS⁴; NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*⁶), San Francisco (*Rogers*); PANAMA, Lion-Hill station (*M. Leannan*).—COLOMBIA; PERU; GUIANA³; AMAZONS⁵; BRAZIL⁴.

The shortest and broadest-winged species of the genus, but subject to some variation. We have examples from the region of the Lower Amazons in which the transverse black

bands of both wings are almost obsolete, giving place to a nearly uniform tawny colour; other specimens have the two upper black bands on the primaries, while the third is absent or nearly so; from this we have every gradation to the deep-black bands mentioned in the description above. The females are of a lighter and duller tawny; and their transverse bands are less strongly indicated. This species ranges southwards from Mexico to Peru and the Lower Amazons; but we are not acquainted with it from Brazil, though Doubleday includes that country within its range ⁴.

2. *Colænis delila*.

Papilio delila, Fabr. Syst. Ent. p. 510¹.

Colænis delila, Butl. & Druce, P. Z. S. 1874, p. 350²; Strecker, Butt. N. Am. p. 108³.

Colænis julia, Butl. & Druce, P. Z. S. 1874, p. 350⁴.

Alis elongatis fulvis, anticis marginibus maculaque ad cellulæ finem (fere obsoleta) nigris; posticis limbo externo linea undulata triplici coloris ejusdem; subtus dilutioribus et nebulosis, angulis posterioribus albo punctatis, posticis striga subcostali flava, puncto coccineo ad cellulæ basin.

Hab. NORTH AMERICA, Texas ³.—MEXICO, Oaxaca (*Fenochio*); BRITISH HONDURAS, Corosal (*Roe*), Sarstoon (*Blancaneaux*); GUATEMALA, San Gerónimo and Zapote (*Champion*), Chuacus, Pacific coast, Polochic, and Motagua valleys (*F. D. G. & O. S.*), Choctum (*Hague*); HONDURAS, San Pedro (*G. M. Whitely*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Rogers, Van Patten* ^{2 4}); PANAMA, Veraguas (*Arcé*).—JAMAICA.

There seems to be some obscurity as to the insect to which Fabricius's name *delila* applies. Mr. Butler in his Catalogue of Fabrician butterflies identifies it with the Jamaican species; and in so doing, we think, he is correct. Central-American specimens, however, are undistinguishable from the Jamaican; and therefore we follow Mr. Butler in his application of the name to this race. It occurs in Mexico, and is found abundantly southwards throughout our country. The primaries of this insect are much more elongated than those of the preceding species, and are somewhat falcate towards the apex. Individuals are subject to slight variation, some being of an almost uniform tawny colour, with the outer margins alone narrowly bordered with black, while in others the black lunule of the primaries mentioned by Fabricius is conspicuous. The series in our collection shows every intermediate between these two extremes, and this without reference to locality. In South America, ranging from Colombia to South-eastern Brazil, it is represented by a very close ally, *C. julia*, in which there are two strongly marked black stripes on the primaries, and the secondaries are also more strongly bordered with the same colour. In Cuba a slightly modified race exists, the male of which corresponds accurately with Cramer's figure of *C. cillene*. It is very similar to *C. delila* and *C. julia*, but differs from both in having a subtriangular black spot at the end of the cell, sometimes followed by a second and smaller one beneath and beyond it. The female of this is of a duller tawny colour, darker towards the base of the wings,

and has a conspicuous black oblique streak crossing the end of the cell. In Haiti a fourth race is found, which is of nearly the same pale tawny colour as *C. cillene*, but the black streak in the primaries of the males extends nearly or quite to the outer margin, and the second streak at the apex is but faintly indicated. This Haitian insect seems to have no specific name. Both *C. delila* and *C. julia* are included in Mr. Strecker's Catalogue of the Butterflies of North America as occurring in Texas.

AGRAULIS.

Agraulis, Boisduval & Leconte, Hist. Gén. Léop. Am. Sept. i. p. 142 (1833); Doubl. Gen. Diurn. Lep. p. 153.

Dione, Hübn. Samml. exot. Schm. ii. t. 20; Verz. bek. Schm. p. 31 (1816).

Though Hübner in 1816 gave the name *Dione* to one of his groups of butterflies containing species of this genus, the genus itself was not properly defined until 1833, when Boisduval and Leconte characterized it under the name of *Agraulis*, afterwards adopted in the 'Genera of Diurnal Lepidoptera.'

The relationship of *Agraulis* with *Colænis* as here restricted is very close, the chief if not the only important difference being in the middle and hind legs. These, as already pointed out by Doubleday, in *Agraulis* are without either paronychia or pulvillus, both being well developed in *Colænis*.

The secondary sexual male organs are like those of *Colænis*, and also very similar to those of *Heliconius*, especially as regards the form of the tegumen, which has an internal projecting piece terminating in a point in the middle line, which points outwards and slightly upwards towards the hook of the tegumen. Nothing of this sort is to be found in *Argynnis* and its allies, so far as we have as yet been able to discover. The antennæ have thirty-nine joints, whereof ten form a gradually thickened terminal club. The palpi have the terminal joint short but swollen; the middle joint is long and but slightly dilated. The front legs of the male are clothed with fine hair; coxa = $\frac{2}{3}$ femur, tibia = femur; tarsus long (single-jointed *) = $\frac{2}{3}$ tibia. The claws of the middle and hind legs are very straight, and there is neither pulvillus nor paronychia; the outer surface of the tibia is slightly spiny. The primaries have the first subcostal branch thrown off before the end of the cell.

Six species are included in the genus *Agraulis*, three of which (*A. vanillæ*, *A. moneta*, and *A. juno*) have a very wide range in Tropical America. *A. glycera* is restricted to the Andes of Venezuela, Colombia, and Ecuador, *A. andicola* to Western Ecuador, and *A. lucina* to the valley of the Upper Amazons. *A. vanillæ* alone is found in the Southern States of North America.

* In *A. lucina* the remains of some of the joints seem to be indicated by notches.

1. *Agraulis juno*.

Papilio juno, Cr. Pap. Ex. t. 215. f. B, C¹.

Agraulis juno, Bates, Journ. Ent. ii. p. 187².

Dione juno, Butl. & Druce, P. Z. S. 1874, p. 350³.

Agraulis huascuma, Reak. Proc. Ac. Phil. 1866, p. 243⁴.

Alis fulvis, anticis fascia obliqua per cellulæ medium, altera ad finem ejus ad limbum externum extendente, apice et margine externo nigris; posticis late nigro marginatis; subtus fusco marmoratis, anticarum apicibus et posticis undique maculis argenteis variis ornatis.

Hab. MEXICO⁴, Cordova (*Höge, Rümeli*), Oaxaca (*Deppe*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Polochic valley (*F. D. G. & O. S.*), Cubilguitz, Tamahu, Teleman Panzos (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Rogers, Van Patten*³); PANAMA, David (*Champion*), Veraguas (*Arcé*), Lion-Hill station (*M. Leannan*). — COLOMBIA and SOUTH AMERICA generally to the Argentine Republic.

The typical form of this wide-ranging species is subject to but little variation; and this only affects the series of indistinct lunules in the outer black border of the secondaries. These are perhaps most prominent in Mexican examples, but further south become less distinct; they disappear altogether in the true *A. juno* of Guiana¹, but can be traced again in Brazilian and Argentine examples. This character is too variable and insignificant to justify Mr. Reakirt's separation of the Mexican insect as *Agraulis huascuma*⁴.

Agraulis juno has two localized races in South America, which occupy much more limited areas than the species now under consideration. One of these, *A. lucina*, Felder, is not uncommon in Upper Amazonia, but seems confined to this and the adjoining district of the Upper Rio Negro. The other, *A. andicola*, Bates, has as yet only been observed on the western slope of Chimborazo, in Ecuador, where Mr. Spruce found it, and supplied Mr. Bates with specimens².

Agraulis juno, though, as already indicated, a species of wide range in Central America, is restricted to the hotter districts of low elevation. Our Guatemala specimens were all taken below 2000 feet above the sea; and those from Mexico are also probably from low-lying districts.

2. *Agraulis moneta*.

Dione moneta, Hübn. Samml. exot. Schmett. ii. t. 20¹.

Argynnis moneta, Poey, Mag. Zool. 1832, t. 11².

Agraulis moneta, Doubl. & Hew. Gen. Diurn. Lep. p. 154, t. 22. f. 1³.

Dione moneta, Butl. & Druce, P. Z. S. 1874, p. 349⁴.

Dione poeyii, Butl. Ann. & Mag. Nat. Hist. ser. 4, xii. p. 227⁵.

Alis fulvis, area basali rufo-brunneis, venis marginibus et strigulis duabus tortuosis per cellulæ finem nigris; posticis linea submarginali dentata maculas fulvescentes includento; anticis subtus ad basin roseis, punctulis minutis nigris notatis, ad apices areaeque tota posticarum vittis argenteis pictis.

Hab. MEXICO³ (*Dupont*²), Ventanas and Ciudad in Durango (*Forrer*), Jalapa (*Höge*), Oaxaca (*Fenochio*); GUATEMALA, Dueñas, Polochic valley (*F. D. G. & O. S.*), Chuacus (*Hague*), Quiche Mountains, San Gerónimo, Purula, Telemán, San Isidro (*Champion*); COSTA RICA (*Van Patten*⁴), Voan de Irazu, Cache (*Rogers*); PANAMA, Volcan de Chiriqui (*Arcé*).—COLOMBIA³; VENEZUELA³; PERU⁵; BOLIVIA.

There is some difficulty about the application of Hübner's name to this species, whether it refers to the same insect subsequently figured by Poey and Doubleday respectively, or to that described by Dr. Felder under the name of *A. glycera*. On a close examination of Hübner's figure we believe it is intended for the former, although it is scarcely dark enough towards the base of the wings on the upperside; the underside, however, agrees well enough in having the pink colouring at the base of the primaries; and on this the small black spots are distinctly indicated, which, from our series of insects, we believe to be a characteristic of the form found in Central America. About the insect named *A. glycera* by Felder there can be no doubt, as the types from which his description was taken have since passed into our hands and are now before us. In this insect, as pointed out by the describer, the deep fulvous colour on the upperside is of uniform tint, whereas in the allied species the base of the wings is of a deep rufous-brown, and the outer portion lighter fulvous.

Mr. Butler, apparently relying upon the comparatively uniform fulvous tint of the upper surface of the primaries in Hübner's figure, asserts⁵ that it and *A. glycera*, Felder, refer to the same butterfly, and takes the opportunity of renaming the older species *Dione poeyii*. Apart from the obvious inconvenience of shifting the name *A. moneta* from one species to another, a practice which can hardly ever be justified, we do not see the necessity for such a step; for had he been guided by another and better character, viz. the presence or absence of black spots in the base of the cell of the primaries beneath, he could have left the names alone. We take this course, and revert to the practice of Doubleday and other authors.

Agraulis moneta, as shown above, has a very wide range, from Mexico to Bolivia. In the former country, and throughout Central America, it is abundant at various elevations from near the sea-level to a height of 6000 or 7000 feet, thus ranging far above its congener *A. junio*.

A. glycera does not occur within our limits, being found in the Andes from Northern Colombia to Bolivia, where it is as abundant as *A. moneta*.

3. *Agraulis vanillæ*.

Papilio vanillæ, Linn. Mus. Ulr. p. 306¹; Cr. Pap. Ex. t. 212. f. A, B².

Dione vanillæ, Butl. & Druce, P. Z. S. 1874, p. 350³.

Agraulis vanillæ, Strecker, Cat. Butt. N. Am. p. 108⁴.

Papilio passifloræ, Fabr. Ent. Syst. iii. p. 60⁵; Smith & Abb. Ins. Georg. i. t. 12⁶.

Alis fulvis, anticis maculis quatuor in cellula, tribus infra eam, strigisque ad marginem externum nigris; posticis maculis discalibus et fascia nigra marginatis, puncta sex rotundata includente; subtus ut supra, sed anticis ad apicem et area tota posticarum maculis oblongatis argenteis pictis.

Hab. NORTH AMERICA from Virginia and Georgia ⁶ southwards ⁴.—MEXICO, Mazatlan and Palmarito (*Forrer*), Cordova (*Rümeli*), Oaxaca (*Fenochio*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Polochic valley (*F. D. G. & O. S.*), San Gerónimo (*Champion*); COSTA RICA (*Van Patten* ³), San Francisco (*Rogers*); PANAMA, Veraguas (*Arcé*), Lion-Hill station (*M'Leannan*).—VENEZUELA; GUIANA ² and SOUTH AMERICA generally to the Argentine Republic; ANTILLES, Cuba, Haiti, Jamaica.

This is a common insect, and has a very extended range; it is included by Smith and Abbot in their work on the Lepidopterous insects of Georgia; and our collection contains a continuous series of examples from all countries southward to the Argentine Republic. Individuals are subject to slight variation: the four black spots within the cell of the primaries in some are united so as to form only two, while the number of those occupying the discal area of the secondaries varies from one to three; the amount also of the black stripes towards the outer margin of the primaries varies; and this occurs without reference to locality. This species was named by Linnæus, who, in his description, refers to the figures in Clerk's 'Icones Insectorum,' Merian's 'Surinam,' and Sloane's 'History of Jamaica.' Fabricius, referring to the same figures, renames the species *P. passifloræ*, doubtless having ascertained the food-plant of the insect; and Smith and Abbot follow him in this, remarking that in Georgia *D. vanillæ* does not feed on the Vanilla, but on the Passion-flower (according to Mr. Strecker *Passiflora cærulea* and *P. incarnata*), as the former plant does not grow there, and therefore Linnæus's name is not a suitable one. Specimens from Haiti, Cuba, and Jamaica are identical with those from the mainland.

In Guatemala *Agraulis vanillæ* is found in suitable localities from the sea-level to an altitude of about 3000 feet above the sea.

CLOTHILDA.

Clothilda, Blanchard, Hist. Nat. Ins. iii. p. 440 (1840); Doubl. Gen. Diurn. Lep. p. 155; Salv. Trans. Ent. Soc. 1869, p. 391.

With the general appearance of some members of the genus *Argynnis*, *Clothilda* differs in many important particulars. The chief and most obvious of these is the presence of a well-defined discocellular nervule in the secondaries, which completely closes the cell of those wings. The first and second branches of the subcostal nervule of the primaries are thrown off before the end of the cell. There is no upper discocellular, the lower discocellular is abruptly bent, where it throws off a small recurrent nervule. The costa of the primaries is strongly arched near its proximal end. The antennæ have thirty-three joints, the terminal nine forming a moderate-sized club.

The palpi have the terminal joint rather short, the middle joint being long, curved, but slightly swollen, and all the joints densely clothed with long hairs. The front legs of the male are covered with long fine hair; the coxa is rather attenuated; coxa = $\frac{2}{3}$ femur; tibia = femur + trochanter; tarsus long (single-jointed), $> \frac{1}{2}$ tibia.

The male secondary sexual organ is very different from that of *Argynnis*. The tegumen, though projecting, is very feeble; the harpagones are large, but slenderly built, and without hooks; inside of them, however, is a strong hook on each side. The penis is long and sharply pointed.

Six species are now known of this genus—two continental, both of which are mentioned below, and four peculiar to the Greater Antilles. Two of these latter are found in Cuba, and two in Haiti. *Clothilda* is one of the few genera found in the Antilles and in Central America and Mexico to the exclusion of the rest of America, both North and South. All the species are said to affect the forests of the higher mountain-ranges where a damp temperate climate prevails.

1. *Clothilda euryale*.

Argynnis euryale, Klug, Neue Schmett. Mus. Berl. pt. i. p. 2, t. 2, f. 1, 2¹.

Clothilda euryale, Doubl. & Hew. Gen. Diurn. Lep. p. 156, t. 21, f. 4²; Salv. Trans. Ent. Soc. 1869, p. 394³.

Synalpe euryale, Boisd. Lép. Guat. p. 36⁴.

Anelia thirza, Hübn. Samml. ex. Schm. iii. t. 34⁵.

Clothilda thirza, Kirby, Syn. Cat. Diurn. Lep. p. 150⁶.

Alis fuscis, anticis supra et subtus distincte rubro notatis, posticis fuscis haud fasciatis.

Hab. MEXICO² (*Deppe*¹), Oaxaca⁴ (*Fenochio*³); GUATEMALA, mountains above Quiche³, Volcan de Fuego³, San Gerónimo and highlands of Vera Paz (*F. D. G. & O. S.*), Cerro Zunil, Purula (*Champion*); HONDURAS?⁴.

This beautiful species was first discovered in Southern Mexico by Deppe, whose specimens passed into the Berlin Museum, and were described by Klug in 1836¹. Probably about the same time the same species was figured in the third (uncompleted) volume of Hübner's 'Sammlung exotischer Schmetterlinge' under the name *Anelia thirza*, a title adopted by Mr. Kirby in his Catalogue⁶, but without real evidence that it was published prior to that of Klug. Since its discovery *C. euryale* has been found from time to time in Southern Mexico, and was captured by us in various parts of Guatemala in 1861–62. Here it is an inhabitant of the highland forests; and though observed as low as about 4000 feet in Vera Paz, it was nowhere so abundant as in the mountains above Quiche, at an altitude of over 8000 feet above the sea. Several specimens were captured there in the month of August as they flew lazily about the foot of a precipice reeking with the moisture of the rainy season.

Mr. Champion has recently sent us specimens, all taken, like our own, in the highland forests of Guatemala.

2. *Clothilda insignis*. (Tab. XIX. figg. 4, 5.)

Clothilda insignis, Salvin, Ent. Trans. 1869, p. 394¹; Butler & Druce, P. Z. S. 1874, p. 349².

C. euryalæ persimilis sed alis posticis ochraceo late transfasciatis.

Hab. COSTA RICA (*Arcé*¹, *Van Patten*²), Volcan de Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Arcé*).

Like the last species, this is an inhabitant of the higher lands. A female was originally sent us by our excellent collector Arcé from the mountain district of Costa Rica; and from this the original description was taken¹. Subsequently Mr. Rogers obtained several examples of *C. insignis* in the volcano of Irazu at an elevation of between 6000 to 7000 feet; and Arcé also found it in the volcano of Chiriqui, beyond which we are not aware that it extends. *C. insignis* closely resembles *C. euryalæ*, but may at once be distinguished from it by the broad submarginal dirty white streak extending across the secondary wings.

The type specimen from Costa Rica, a female, is figured.

EUPETOIETA.

Eupetoieta, Doubleday, Gen. Diurn. Lep. p. 168 (1848).

This genus, which includes the two following species of wide range, has a close general resemblance to *Argynnis*, with which it has many characters in common.

Like *Argynnis*, the secondary male sexual organs have a well-developed tegumen with a long median hook. The antennæ have forty-one joints, the terminal twelve forming a rather abrupt club (in *Argynnis selene* the number of joints is thirty-five). The palpi have a very small terminal joint, the middle joint being much distended, especially towards the distal end. The front legs of the male are clothed with fine hairs; coxa stout, $=\frac{3}{4}$ femur, tibia $=\frac{5}{6}$ femur, tarsus (single-jointed) $=\frac{2}{3}$ tibia. In *Argynnis selene* the femur is rather shorter in proportion to the coxa, and the tarsus not more than $\frac{1}{2}$ the tibia. The claws of the hinder legs are much straighter than in *Argynnis*; but the tibia are spiny all over as in that genus. In the primary wings the second subcostal branch is thrown off further from the end of the cell than is usual in *Argynnis*.

1. *Eupetoieta claudia*.

Papilio claudia, Cr. Pap. Exot. t. 69. f. E, F¹.

Eupetoieta claudia, Strecker, Butt. N. Am. p. 109².

Argynnis columbina, Boisd. & Lec. Lép. Amér. Sept. t. 44³.

Alis fulvis, lineis variis transeuntibus nigris, ea per medium alarum angulosa, serie punctorum margini externo parallela, maculaque ovata in cellula anticarum nigris; subtus anticis fero et supra, sed ad apicem et area tota posticarum pallide nebulosa.

Hab. UNITED STATES^{2 3}, Texas, Arizona².—MEXICO, Cordova (*Rümeli*); GUATEMALA,

Volcan de Fuego (*F. D. G. & O. S.*), Purula (*Champion*).—ARGENTINE REPUBLIC; JAMAICA¹.

This and the following species are very closely allied, so much so that, had we to judge from the markings of the wings alone, it might become a question if they ought not ultimately to be united. We notice, however, that an important difference is perceptible in the genital armature of the males which points to their real specific difference. The upper lobe of the harpagones in *E. claudia* is armed with six or seven strong recurrent spines, a feature we are unable to trace in *E. hegesia*.

Cramer describes both species as coming from Jamaica¹; that named and figured by him as *P. claudia* has the zigzag transverse line passing across the centre of both wings, while the under surface is, with the exception of the basal half of the primaries, which resembles the upper surface, of a clouded greyish-brown colour. The figure of *P. hegesia* differs from that of *P. claudia* in the absence of the transverse black lines on the basal half of the secondaries, and in the apex of the primaries and the whole of the secondaries on the under side being of a mottled rufous-brown colour. As regards this latter character, however, we have some specimens which appear to be intermediate in this respect; and consequently we place but little stress upon it. In our series all the specimens which are without the zigzag line on the secondaries are, both above and beneath, of a darker colour. As regards their distribution, both forms are certainly found together in Mexico and as far south as Guatemala; thence to Rio our collection contains only examples of *E. hegesia*; in the Argentine Republic, however, a race exists which resembles *E. claudia* so closely that we have placed it under that name. There is considerable difference in the size of specimens of *E. claudia*, some from Guatemala being no more than half that of those from the United States and Mexico; but the markings in each are the same.

In Guatemala *E. claudia* is an upland species, being found in the mountains, in places ranging between 3000 and 7000 feet above the sea.

2. *Eupetoieta hegesia*.

Papilio hegesia, Cramer, Pap. Exot. t. 209. f. E, F¹.

Euptoieta hegesia, Butl. & Druce, P. Z. S. 1874, p. 349²; Strecker, Butt. N. Am. p. 109³.

E. claudia persimilis, sed linea per medium posticarum transversa carente, subtus alis rufescentioribus.

Hab. SOUTHERN UNITED STATES³.—MEXICO, Tres Marias islands and Ventanas (*Forrer*), Cordova (*Rümeli*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Choctum (*Hague*), Polochic valley, San Gerónimo, central valleys (*F. D. G. & O. S.*), Panzos, Coban, San Isidro (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²), Cache (*Rogers*); PANAMA, Veraguas (*Arcé*).—COLOMBIA; VENEZUELA; AMAZONS; GUIANA; BRAZIL; CUBA; JAMAICA¹.

Closely resembles *E. claudia*, but, as before said, differs from it in having no black

transverse line on the proximal half of the secondaries; it is also of a more mottled rufous colour beneath. Further particulars have been given under the preceding species.

E. hegesia overlaps *E. claudia* in the Southern United States and in Mexico and Guatemala, but in Costa Rica and throughout its wide range in South America it is found alone. In Guatemala it usually occurs in places of a lower level than those where *E. claudia* flies, and probably is not found at a higher elevation than 4300 feet at Coban and 3000 feet at San Gerónimo, whence it descends to the sea-level at Panzos.

SYNCHLOE.

Synchloe, Doubleday, Gen. Diurn. Lep. p. 185 (1848) (ex Boisd. MS.).

Chlosyne, Butl. Cist. Ent. i. p. 38.

Coatlantona, Kirby, Syn. Cat. Diurn. Lep. p. 178.

This name was applied by Hübner to a "coitus" of Pieridæ in 1816, and for this reason was transferred by Messrs. Butler and Kirby to *Pieris daplidice* and its allies, a new name being given by each author to the present insects. As, however, Doubleday had in 1848 fully described this genus under the title *Synchloe*, we prefer to adhere to his ruling.

The secondary male sexual organs in *Synchloe* are very like those of *Melitæa* (*M. cinxia*). The tegumen is atrophied, and is simply a transverse bar with no projecting median hook; the harpagones are short and rounded, but armed with two terminal strong hooks recurved towards each other like the horns of an ox. This arrangement is very different to what we find in *Argynnis* (*A. selene*). The antennæ have thirty-nine joints, the terminal sixteen forming a moderately abrupt club. The palpi are like those of *Melitæa*, the terminal joint being thicker than in *Phyciodes*, and the middle joint swollen gradually towards the middle. The front legs of the male are clothed with fine hairs. The coxa is rather stout, $< \frac{1}{2}$ femur + trochanter, tibia = $\frac{5}{6}$ femur, tarsus (single-jointed*) = $\frac{3}{4}$ tibia. In *Melitæa cinxia* the tarsus is two-jointed and = $\frac{1}{2}$ tibia. The claws of the other legs are curved; and the tibia is without spines on the upper surface as in *Melitæa*.

The metropolis of *Synchloe* is certainly Mexico and Central America, where no less than ten out of about thirteen species are found. The extralimital species are:—*S. perezi*, peculiar to the island of Cuba; *S. tulita*, peculiar to the island of Puerto Rico; and on the continent of South America we find *S. narva* in Venezuela, a close ally of *S. bonplandi*. In North America races of *S. lacinia* occur in Texas and Arizona.

a. Primary wings but slightly elongated.

a'. Discal area of secondaries red (brownish black in some varieties of *S. lacinia*).

1. *Synchloe lacinia*. (Tab. XIX. figg. 6–17.)

Araschnia lacinia, Geyer in Hübn. Zutr. Ex. Schmett. Fünft. Hund. p. 25, f. 899, 900¹.

Chlosyne lacinia, Butl. & Druce, P. Z. S. 1874, p. 349².

* At the end of the tarsus are some notches, apparently indicating the sutures of the last terminal joints.

Synchloe saundersii, Doubl. & Hew. Gen. Diurn. Lep. p. 186, t. 24, f. 2³.

Synchloe tellias, Bates, Ent. Monthl. Mag. i. p. 84⁴; iii. p. 157⁵.

Synchloe quehtala, Reak. Pr. Ac. Phil. 1866, p. 248⁶.

Synchloe ardema, Reak. Pr. Ac. Phil. 1866, p. 336⁷.

Synchloe paupera, Feld. Reise d. Nov., Lep. p. 395⁸.

Synchloe mediatrix, Feld. Reise d. Nov., Lep. p. 395⁸; Strecker, Butt. N. Am. p. 126¹⁰.

Synchloe misera, R. Feld. Verh. z.-b. Ges. Wien, 1869, p. 471¹¹.

Synchloe pretona, Boisd. Lép. Guat. p. 37¹².

Synchloe crocale, Edw. Trans. Am. Ent. Soc. v. p. 17¹³; Strecker, Butt. N. Am. p. 127¹⁴.

Chlosyne adjutrix, Scudd. Bull. Buff. Soc. ii. p. 269¹⁵.

Synchloe adjutrix, Strecker, Butt. N. Am. p. 126¹⁶.

Synchloe adelina, Stand. Verh. z.-b. Ges. Wien, 1875, p. 102¹⁷.

Alis fusco-nigris ciliis albo intermixtis, anticis lineis duabus transversis bifractis punctorum alborum ornatis; posticis area discali rufa et ad basin rufo variegatis: subtus anticis ut supra, costa ad basin rufa maculis alteris flavis submarginalibus notatis; posticis fascia lata flava transvittatis, extra eam serie punctorum ruforum deinde serie altera punctorum nigrorum albo pupillatorum maculisque sox submarginalibus flavis notatis.

Obs. Species valde mutabilis, interdum posticis fere omnino nigris (= *S. adelina*¹⁷), interdum anticis fascia lata rufa et maculis rufis ornatis (= *S. saundersi*³ et *S. adjutrix*¹⁵).

Hab. NORTH AMERICA, Arizona¹³, Texas¹⁵.—MEXICO (*Karwinski*¹, *Deppe*), Vera Cruz (*W. H. Edwards*⁷), Orizaba (*Sallé*), Huahuapan (*Hedemann*¹⁰), Oaxaca (*Fenochio*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA^{4 12}, Yzabal, Motagua valley, Dueñas, Pacific coast (*F. D. G. & O. S.*), Polochic valley (*Hague*); NICARAGUA (*Bridges*), Chontales (*Belt*); COSTA RICA (*Carmiol*, *Van Patten*²), San Francisco, Volcan de Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Ribbe*¹⁶, *Arcé*), Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—COLOMBIA^{8 9}; VENEZUELA³; ECUADOR; PERU; BOLIVIA.

The Mexican insect described by Geyer as *S. lacinia*¹, and which is very nearly represented by figg. 6, 7 on our Plate, occupies an intermediate position between the extreme varieties of this species, which, on the one side, lose all their bright markings and become (as represented by figg. 16, 17) the *Synchloe adelina* of Staudinger¹⁷; on the other hand, the amount of colour is increased to a considerable extent, till we have *S. saundersi*³ (approximately represented by figg. 8, 9). Between these extremes every gradation of colour can be traced; and all the rufous markings, as well as the yellow ones of the underside, can be exhibited in different individuals from their maximum development till they vanish altogether.

Though in nearly every part of Central America each gradation is found, it is very evident that certain varieties preponderate in numbers in certain districts. Thus in Mexico the dark extreme (*S. adelina*) occurs with the true *S. lacinia*, and also intermediate forms; but the dark form, perhaps, slightly predominates. In Guatemala the *S. lacinia* pattern is by far the most abundant; but this also passes by almost insensible steps (figg. 14, 15) into the dark extreme (figg. 16, 17). In Nicaragua the prevalent form approaches the *S. saundersi* type. In Costa Rica the *S. adelina* type is most

abundant, but still associated with *S. lacinia*, and connected with it as shown by figg. 12, 13. The same state of things prevails in Panama. In South America *S. saundersi* is far the commonest form, but still the steps to *S. adelina* are not altogether absent.

In the Southern States of North America a form occurs which is very like *S. saundersi* and is prevalent in Texas. This is *S. adjutrix*, Scudder¹⁵; but we doubt the possibility of maintaining its distinction. In Arizona another form occurs, *S. crocale*, Edw., which we take to be undistinguishable from *S. adelina*, and therefore connected with the whole series.

Regarding the other names which have been proposed for varieties of this butterfly, *S. tellias*⁴ is equivalent to *S. lacinia*⁵. *S. quehtala*⁶ is like *S. adelina* above, with traces of the yellow band of the secondaries beneath still extant. A form identical with or very similar to this is *S. misera*¹¹. *S. ardema* is also like *S. adelina*, but has two rufous spots near the inner margin of the primaries (see figg. 12, 13). *S. paupera*⁸ is like *S. adelina* above and *S. lacinia* beneath. *S. mediatrix*⁹ comes between *S. lacinia* and *S. saundersi*. *S. pretona*¹² is like *S. adelina*, but with rufous instead of white marks on the primaries.

The proposers of these names give in detail their characters; but the position of each is generally indicated above.

In Guatemala *S. lacinia* is very abundant up to an elevation of about 5000 feet. Our series of varieties mostly come from the valley of the Polochic river.

Our figures represent the following specimens:—

Figg. 6, 7, a male, from Oaxaca, Mexico.

„ 8, 9, a female, from Corosal, British Honduras.

„ 10, 11, a male, from Nicaragua.

„ 12, 13, a female, from Costa Rica.

„ 14, 15, a female, from Polochic valley, Guatemala.

„ 16, 17, a male, from Calobre, Panama.

2. *Synchloe janais*.

Papilio janais, Drury, Ill. Ex. Ins. iii. p. 22, t. 17. ff. 5, 6¹.

Synchloe janais, Doubl. Gen. Diurn. Lep. p. 186²; Boisd. Léop. Guat. p. 37³.

Chlosyne janais, Butl. & Druce, P. Z. S. 1874, p. 349⁴.

Alis nigris, anticis albo punctatis, posticis area basali rufis; subtus dimidio basali flavis nigro-maculatis, fascia rufa exteriori, altera punctorum alborum, lunulis submarginalibus flavis, anticis costa ad basin nigris.

Hab. MEXICO², Cordova (*Rümel*), Oaxaca (*Fenochio*), Lerma, in Yucatan (*Hedemann*); GUATEMALA, forests of Northern Vera Paz (*F. D. G. & O. S.*), Cubilguitz, Tamahu (*Champion*), Polochic valley (*Hague*); HONDURAS², San Pedro (*G. M. Whitely*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*⁴, *Carmiol*), San Francisco and Cache (*Rogers*) PANAMA, Veraguas (*Arcé*).

Drury, who carefully described and figured this species¹, gave "Sierra Leon" as its habitat—an error no doubt, as it has since been proved to be an insect peculiar to Mexico and Central America, where it occurs abundantly in all low-lying districts. In its general appearance it much resembles the typical form of the variable *S. lacinia*, but may at once be distinguished from it by the whole costa of the primaries beneath being black and without the rufous spot at the base.

b'. Discal area of secondaries black.

3. *Synchloe hyperia*.

Papilio hyperia, Fabr. Ent. Syst. iii. p. 119¹.

Synchloe hyperia, Butl. Cat. Fabr. Diurn. Lep. p. 113².

Araschnia hippodrome, Geyer in Hübner, Zutr., fünft. Hund. p. 17³.

Synchloe hippodrome, Doubl. Gen. Diurn. Lep. p. 186⁴; Godm. & Salv. Trans. Ent. Soc. 1880, p. 123⁵.

Chlosyne hippodrome, Butl. & Druce, P. Z. S. 1874, p. 349⁶.

Alis nigris, anticis fascia bifida maculosa apicem versus alba; subtus posticis fascia mediana maculosa rubra, altera punctorum alborum exterior, lunulis submarginalibus et punctis ad basin flavis.

Var. *S. hippodrome* posticis punctis ad basin flavis nullis.

Hab. MEXICO⁴ (*Karwinski*³, *Nieto*), Atayac (*Hedemann*), Cordova (*Rümeli*, *Bilimek*), Oaxaca (*Deppe*, *Fenochio*); GUATEMALA, Chuacus (*F. D. G. & O. S.*), Polochic valley (*Hague*), San Gerónimo (*Champion*), Pantaleon, Panima, Chacoj, Teleman (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*⁶); PANAMA, David (*Champion*), Calobre (*Arcé*).—COLOMBIA⁵.

There can be no doubt, we think, that Fabricius's name "*Papilio hyperia*, hab. in Indiis,"¹ is referable to the southern form of the species, usually known as *Synchloe hippodrome*, which has yellow spots at the base of the secondaries beneath not seen in more northern specimens. These are best shown in our examples from Manaure in Northern Colombia⁵, but can also be traced in a less degree in Panama insects. In Costa Rica both forms occur, but in none are the yellow spots more than just visible, showing that here the two races coalesce.

The name *S. hippodrome* was applied by Geyer to Mexican specimens obtained by the traveller *Karwinski*³; and the species has since been found abundantly in the southern parts of that country. In Guatemala it is also a common insect at various elevations up to about 3000 feet.

4. *Synchloe melanarge*. (Tab. XX. figg. 9, 10.)

Synchloe melanarge, Bates, Ent. Monthl. Mag. i. p. 85¹.

Synchloe paupera, Boisd. Léop. Guat. p. 38² (nec *Felder*).

Alis nigris, anticis fascia maculosa arcuata flava; subtus ut supra, sed posticis lunulis submarginalibus flavis, macula (interdum aliis fasciam interruptam formantibus) ad angulum analem rubra, costa ad basin anticarum coloris ejusdem.

Hab. MEXICO?; GUATEMALA^{1,2}, Yzabal, Motagua valley (*F. D. G. & O. S.*), Tocoy (*Champion*); NICARAGUA, Chontales (*Belt*).

Our original specimens of this peculiar species, one of which is figured, were all obtained in the valley of the Motagua, at an elevation of about 1000 feet above the sea, and at Yzabal on the shores of the lake of the same name. Since then the only Guatemalan examples we have received were procured by Mr. Champion at Tocoy, in the Motagua valley; hence it appears that in Guatemala at least *S. melanarge* has a very restricted range. Our authority for including Mexico within its range rests on a single specimen in our possession without authority, said to be from that country. Near Chontales it is not uncommon, Belt having captured it in some numbers.

c. Discal area of secondaries above yellow, base of costa of primaries beneath red.

5. *Synchloe erodyle*. (Tab. XX. figg. 3, 4.)

Synchloe erodyle, Bates, Ent. Monthl. Mag. i. p. 84¹.

Chlosyne erodyle, Butl. & Druce, P. Z. S. 1874, p. 349².

Alis nigris, anticis albo maculatis, posticis area basali irregulariter flavis, macula ad angulum analem (interdum pluribus) rubra; subtus ut supra, sed posticis maculis rubris quatuor (interdum quinque), duabus ad angulum analem, alteris apicem versus, anticis costa ad basin rubra, palpis nigris lateraliter albis.

Hab. MEXICO (*Bilimek*), Oaxaca (*Fenochio*); GUATEMALA¹, Motagua and Polochic valleys (*F. D. G. & O. S.*), Teleman (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²).

There is some confusion as to the application of this name, which appears to have originally been one of the many uncharacterized ones put in circulation by the late Dr. Boisduval. Mr. Bates, however, restricted its use to the insect with white spots on the primaries, and thus named specimens obtained by us in various parts of the interior of Guatemala¹. So far as Guatemala and Nicaragua are concerned, there is little variation between specimens of this race, all having white-spotted primaries; but in Southern Mexico these have a yellowish tinge, and in this respect approach *S. pæcile*, the southern form. These Mexican specimens, however, have the spots of the primaries of the same rounded shape as those of *S. erodyle*; and we therefore place them under that name, not, however, without some hesitation.

One specimen in our collection is peculiar in having the primaries unspotted black; but this we take to be an individual aberration.

S. erodyle is a lowland form, and is probably not found at a greater elevation than 2000 feet above the sea.

A female, from the Polochic valley, is figured.

6. *Synchloe pæcile*. (Tab. XX. figg. 1, 2.)

Synchloe pæcile, Feld. Voy. Nov., Lep. p. 396¹; Godm. & Salv. Trans. Ent. Soc. 1880, p. 123².

S. erodylæ similis, sed anticis flavo (nec albo) maculatis.

Hab. PANAMA, Volcan de Chiriqui (*Champion*), Calobre (*Arcé*).—COLOMBIA ^{1 2}; VENEZUELA.

This name was applied by Dr. Felder to specimens from the neighbourhood of Bogota, whence we also have received it, and also from Manaure, in the northern portion of the same country. These southern examples are all larger than the insects from Panama, and have four instead of two red spots on the secondaries; but they are alike in the yellow spots of the primaries, and do not differ sufficiently for separation. The species is apparently not uncommon in the western portion of the State of Panama; but we have not yet seen any specimens from the line of railway.

7. *Synchloe melitæoides*.

Synchloe melitæoides, Feld. Voy. Nov., Lep. p. 396¹.

S. erodyle similis, sed palpis albidis, posticis subtus flavissimis.

Hab. MEXICO ¹ (*Koppe*, *Mus. Berol.*).

A little-known species, described by Dr. Felder from specimens in the Berlin Museum. We possess a single example, without locality, which was formerly in the collection of Dr. Kaden, which agrees accurately with the above description. From this we gather that *S. melitæoides* is a species fairly distinct from *S. erodyle*, having the palpi nearly white instead of black with white sides; the secondaries beneath have the yellow much more extended, and the black, so prominent in the allied species, is reduced to small spots. The yellow spots on the primaries beneath, too, are much larger.

b. Primary wings short and rounded.

8. *Synchloe marina*.

Araschnia marina, Geyer in Hübner, Zutr., fünft. Hund. p. 20, ff. 877, 878¹.

Alis rotundatis, fusco-nigris, anticis albo punctatis, posticis fascia maculosa transversa flava, maculis duabus ad angulum analem aliisque apicem versus rubris; subtus maculis omnibus majoribus et pallide flavis, anticis costa ad basin maculaque in cellula ferrugineis, posticis flavis nigro notatis et maculis quatuor marginem externum versus rubris.

Hab. MEXICO (*Sommer* ¹), Huahuapan (*Hedemann*), Oaxaca (*Fenochio*).

This peculiar species is restricted in its range to Southern Mexico, whence we have received a few specimens from Don A. Fenochio, and seen others in the Vienna Museum. It was originally described and figured by Geyer from examples in the Sommer collection ¹.

One of the chief characteristics of *S. marina* is the shortness of its primaries, giving the insect the general appearance of some members of the genus *Phyciodes*. We believe, however, that it is rightly placed here.

c. Primaries much elongated, base of costa beneath black.

9. **Synchloe gaudialis.** (Tab. XX. figg. 5, 6.)

Synchloe gaudialis, Bates, Ent. Monthl. Mag. i. p. 84¹; Boisd. Lép. Guat. p. 37².

Chlosyne gaudialis, Butl. & Druce, P. Z. S. 1874, p. 349³.

Alis nigris valde elongatis, anticis macula discali coccinea, punctis in linea bifracta marginem versus albis, posticis plaga in area basali venis divisa flava, punctis fere obsoletis exterioribus albis; subtus ut supra, maculis omnibus majoribus et posticis lunulis submarginalibus flavo illitis.

Hab. GUATEMALA ^{1 2}, forests of Northern Vera Paz and Polochic valley (*F. D. G. & O. S.*), Cubilguitz, Zapote (*Champion*); HONDURAS²; NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten* ³), Volcan de Irazu, Cache (*Rogers*).

Mr. Bates described this species for us from specimens obtained in the forest-region of Northern Vera Paz, where we found it by no means uncommon in the months of February and March 1862, at an elevation of about 1500 feet above the sea. Since then Mr. Champion has met with it in the same districts, and also on the slopes of the Volcan de Fuego, about 2000 feet above the Pacific Ocean. It is also fairly abundant in Nicaragua and Costa Rica, the latter country being the limit of its southern as Guatemala is of its northern range.

Specimens on the whole are fairly constant in their markings; but there is slight variation in the size of the characteristic scarlet spot of the primaries, which in some cases, especially in southern ones, trespasses beyond the limits of the cell.

We have figured a male, one of the types, from the Polochic valley, in Guatemala.

10. **Synchloe bonplandi.** (*S. narva*, Tab. XX. figg. 7, 8.)

Cethosia bonpland, Latr. in Humb. Obs. Zool. i. p. 199, t. 18. f. 5¹.

Synchloe bonplandi, Doubl. & Hew. Gen. Diurn. Lep. p. 186, t. 24. f. 3² (partim); Boisd. Lép. Guat. p. 38³.

Chlosyne narva, Butl. & Druce, P. Z. S. 1874, p. 349⁴ (nec Fabricius).

Alis valde elongatis, nigris; anticis maculis aurantiacis, posticis area basali coloris ejusdem striga transversa atra divisa, alis ambabus serie marginali punctorum alborum; subtus fere ut supra, sed alis maculis flavis (nec aurantiacis) et punctorum serie submarginali duplici notatis (in anticis utraque alba, in posticis exteriore flava).

Hab. COSTA RICA (*Van Patten* ⁴), Volcan de Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Zahn, Champion*), Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—COLOMBIA; ECUADOR ¹.

There appear to be two races of this form, one found in Ecuador and Colombia, which spreads northwards as far as Costa Rica, to which Latreille's name *bonplandi* is applicable. The other is peculiar to Venezuela and North-eastern Colombia; and for this Fabricius's name may be used. The chief difference between these two races consists in the greater extent and in the orange tint of the yellow spots of the more western insect. As they seem to have definite limits, these two races may be kept separate.

S. bonplandi is not uncommon in the State of Panama and in Costa Rica, but seems restricted to the low-lying districts.

A male, from Lion Hill, is figured.

ERESIA.

Eresia, Boisduval, Sp. Gén. t. 7 B. f. 8 (1836); Doubl. Gen. Diurn. Lep. p. 182.

The species now usually associated in this genus have elongated primary wings; and in some the pattern of the colour of these wings is very different in the two sexes. These points are most strongly shown in *E. eranitis*, *E. alcina*, and the allied species: they are not, however, universally present; and the line of demarcation between *Eresia* and *Phyciodes* is nearly broken down by such species as *E. myia* and *E. ofella*. Then, again, there is a large section of the genus, the members of which mimic the colour and the shape of the wings of other Butterflies. Thus several South-American species take the pattern of corresponding species of *Actinote*; others are like *Heliconius* or *Mechanitis* on a small scale; others, again, resemble *Colænis* and even *Callicore* and *Threnodes* (Erycinidæ). We thus have a very mixed assemblage of insects, the relationship of which is somewhat obscure; and future researches may tend either to their further separation or to the transference of some species to the genus *Phyciodes*, itself one of some complexity. So far as the Central-American species are concerned, the character of the elongated primaries seems the best indication of the genus as distinguished from *Phyciodes*.

The antennæ of *E. alsina* have thirty-seven joints, the terminal fourteen forming a rather abrupt club. The terminal joint of the palpi is rather more attenuated than in *Melitæa*, but not quite so much so as in typical *Phyciodes*; the middle joint is rather swollen towards the distal end. The front legs of the male are slightly hairy; the coxa stout, $< \frac{1}{2}$ femur + trochanter; tibia $<$ femur, tarsus (single-jointed) $= \frac{1}{2}$ tibia. The claws of the other legs are much curved, and the tibia not spiny on the outer surface. The first subcostal branch of the primaries is thrown off before the end of the cell, the second after it, as in all these closely allied genera.

Eresia, as we understand it, contains between fifty and sixty species, which are widely distributed over tropical South America. Of these, thirteen are found within our limits.

a. Wings more or less elongated and coloured fulvous and black.

a'. Sexes nearly alike.

1. *Eresia mechanitis*. (Tab. XX. figg. 13, 14.)

Eresia mechanitis, Godm. & Salv. P. Z. S. 1878, p. 269¹.

Eresia eunice, Butl. & Druce P. Z. S. 1874, p. 350².

Alis fusco-nigris, anticis fascia curvata (in regione venæ medianæ bifurcata) a basi ad angulum analem fulva, apice fasciis duabus flavicantioribus transvittata; posticis area interna fulva fascia transversa nigra

notata; subtus ut supra, sed alis dilutioribus et flavicantioribus marginibus nigris externis lunulis flavis vix notatis.

Hab. NICARAGUA, Chontales (*Janson*); COSTA RICA (*Van Patten*²).

This species is closely allied to the South-American *E. eunice* (Hübner), well described in several of its forms by Mr. Bates*. From all of these forms *E. mechanitis* differs in having the apex of the wings crossed by two well-defined yellowish tawny bands, the innermost of which has but slightly indented margins instead of being broken up into an indefinite band. The outer band is distinct, instead of being a faint spot as in *E. eunice*.

As in the region of the Amazons, this form of *E. eunice* follows the colour-pattern of the races of *Mechanitis polymnia* and *Heliconius numata* found in the same district—*Mechanitis doryssus* and *Heliconius telchinia* being what may be called the homœochromatic associates of *E. mechanitis*.

E. mechanitis is a scarce species; for the type from Nicaragua¹ and two specimens from Costa Rica are the only ones we have yet seen.

Our figure is taken from the Nicaraguan type.

2. *Eresia drypetis*. (Tab. XX. figg. 11, 12.)

Eresia drypetis, Godm. & Salv. P. Z. S. 1878, p. 269¹.

E. mechanitis similis, sed margine anticarum interno fulvo nec nigro, macula flavicante ad apicem minore, et fascia transversa posticarum nigra angustiore distinguenda.

Hab. GUATEMALA, interior (*F. D. G. & O. S.*¹); PANAMA, Lion-Hill station (*M^r Leannan*¹).
—COLOMBIA.

This, too, is a close ally of *E. eunice* and the last-mentioned species, but differs in several points. The transverse band of the secondaries is so narrow as to be almost broken up into spots; and it resembles in this respect the race of *E. eunice* described by Mr. Bates as *E. olivencia*. The band across the primaries is isolated and distinct, though the spot in the apex is much smaller than in *E. mechanitis*. The tawny colour of the base of the primaries reaches to the inner margin; and the black mark over the median nervure in *E. eunice* and *E. mechanitis* is almost obsolete.

Though, as will be seen above, *E. drypetis* has a wide range, it is by no means a common insect. A single Guatemalan example and two from Panama are all the Central-American specimens we possess. The former was taken by us in 1862; but the record of the precise locality has been lost: it was most probably from the department of Vera Paz. Besides these examples we have lately received others from Dr. Staudinger, which were taken in Western Colombia, on the Rio San Juan, not far from San Buenaventura.

We have figured a Panama specimen.

* Journ. Ent. ii. p. 191.

3. *Eresia aveyrona*.

Eresia aveyrona, Bates, Journ. Ent. ii. p. 192, t. 10. f. 4¹.

Alis valde elongatis, nigro-fuscis, plaga magna (externe lacerata) ad anticarum apicem, altera arcuata a basi ad angulum analem extendente fulvis; posticis area interna fulva, margine externo nigro, linea fulva angulum analem includente: subtus maculis fulvis flavicantioribus et majoribus, macula anticarum apicali linea nigra bisecta, posticarum costa ad basin flava, et posticis linea submarginali alba notatis.

Hab. COSTA RICA (*Van Patten*); PANAMA, Chiriqui (*Ribbe*).—ECUADOR; AMAZONS¹.

Mr. Bates described this species from a single female example captured by himself at Aveyros on the Tapajos river¹. Since then Mr. Buckley has found male specimens in Eastern Ecuador, both at Cururai and Sarayacu. We also have males from Central America from the sources given above. These latter agree very well with the Ecuador insects, the only difference we can detect being in the tawny spot of the apex of the primaries, the upper edge of which is more ragged.

Though of wide range, *E. aveyrona* appears to be everywhere rare. Its homœochromatic associate is *Eueides aliphera* (anteà, p. 163), a very common insect, and on a larger scale *Colænis delila* (anteà, p. 168).

b'. Sexes differently marked.

4. *Eresia eranites*.

Eresia eranites, Hew. Ex. Butt., *Eresia*, t. 2. ff. 8–10¹; Butl. & Druce, P. Z. S. 1874, p. 350².

♂. Alis anticis fusco-nigris, area mediana, macula ultra cellulam, altera bifida infra eam alisque minoribus apici propius fulvis; posticis interne fulvis, margine externo nigro et fascia submarginali nigra notatis: subtus alis multo pallidioribus et maculis, præter aream anticarum medianam, ochraceo tinctis, anticarum apicibus ochraceo notatis; posticis serie punctorum nigrorum submarginali ornatis.

♀. Major, maculis omnibus magis distinctis, iis ad anticarum apices ochraceis.

Hab. MEXICO, Cordova (*Rümeli, Hedemann*); GUATEMALA, forests of Northern Vera Paz (*F. D. G. & O. S.*), Polochic valley (*Hague*), Cubilguitz (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²), Cache (*Rogers*); PANAMA, Volcan de Chiriqui, 2000 to 3000 feet (*Champion*), Santa Fé (*Arcé*).—COLOMBIA¹; VENEZUELA; ECUADOR.

A common species in the hotter parts of Guatemala, where it frequents forests up to an elevation of about 2000 feet. Its range extends northwards into Southern Mexico, and southwards throughout Central America to Ecuador, where Mr. Buckley found it near Macas.

E. eranites was originally described by Hewitson from Colombian specimens¹, whence we have a male. This agrees closely with Mexican examples, the species varying but little throughout its wide range.

5. *Eresia phillyra*.

Eresia phillyra, Hew. Ex. Butt., *Eresia*, t. 1. f. 1¹.

Eresia ezorias, Hew. Ex. Butt., *Eresia*, t. 2. f. 13².

BIOL. CENTR.-AMER., Rhopal., Vol. I., August 1882.

2 B

- ♂. Alis anticis elongatis, fusco-nigris, margine externo paulo incurvo, area anticarum mediana ad angulum analem extensa et venis nigris divisa, fasciisque duabus transversis ultra cellulam, venis quoque divisis, fulvis; posticis interne fulvis, costa, margine externo et fascia transversa nigro notatis: subtus alis pallidioribus, fasciis ad anticarum apicem flavidis, posticis lunulis submarginalibus albidis notatis.
- ♀. Major, anticis minus productis, maculis ad apicem et ad marginem externum ochraceis.

Hab. MEXICO ^{1 2}, Cordova (*Rümel*, *Höge*), Oaxaca (*Fenochio*); GUATEMALA, forests of Northern Vera Paz and Motagua valley (*F. D. G. & O. S.*), Polochic valley (*Hague*), Purula and Teleman (*Champion*).

The difference between the sexes of this species led Hewitson to describe them under different names, the female as *E. phillyra* ¹ and the male as *E. ezorias* ², both specimens being from Mexico. We have since obtained from Mexico and Guatemala a large series of both sexes, and have no hesitation in placing them as one species. In Guatemala and doubtless elsewhere *E. phillyra* is a forest species, ranging in altitude from nearly the sea-level to a height of about 4000 feet.

As will be seen above, *E. phillyra* does not appear to be found south of Guatemala. In Nicaragua and Costa Rica its place is taken by *E. alsina*, a species from which it may easily be distinguished by the black transverse band of the secondary wings.

6. *Eresia alsina*.

Eresia alsina, Hew. Trans. Ent. Soc. 1869, p. 33 ¹; Ex. Butt., *Eresia*, t. 8. ff. 62, 63 ².

E. phillyrae similis, sed anticis minus falcatis, maculis alarum fulvis paulo dilutioribus, fasciaque posticarum nigra transversa absente distinguenda.

Hab. NICARAGUA, Chontales (*Belt* ^{1 2}); COSTA RICA (*Van Patten*), Cache (*Rogers*).

This was one of Belt's discoveries in Nicaragua, whence he sent many specimens, some of which passed into Hewitson's collection ¹ and some into ours. We now trace it southwards to Costa Rica, where it appears to be not uncommon in the lowland forests. As already mentioned, it has a close ally in the more northern *E. phillyra*; and southwards, in the State of Panama, several allied forms take its place.

7. *Eresia nigripennis*. (Tab. XX. figg. 15, 16.)

Eresia nigripennis, Salv. Ann. & Mag. N. H. ser. 4, iv. p. 170 ¹.

Eresia dismorphina, Butl. Cist. Ent. i. p. 78 ²; Lep. Ex. p. 182, t. 63. f. 1 ³; Butl. & Druce, P. Z. S. 1874, p. 350 ⁴.

- ♂. Alis anticis elongatis falcatis fusco-nigris, maculis indistinctis ultra cellulam serie duplici transversa positae alteraque inter ramos medianos primum et secundum flavis; posticis area interna fulva, costa et margine externo anguste nigris, maculis duabus indistinctis ad angulum apicalem: subtus ut supra, sed maculis flavis multo majoribus, anticis plaga magna fulva ad basin notatis; posticis medialiter albicantibus, et lunulis submarginalibus ornatis.
- ♀. Mari nonnihil similis, alis anticis minus falcatis et maculis flavis multo magis distinctis, plaga quoque indistincta fulva in regione venae medianae.

Hab. COSTA RICA (*Carmioli* ¹, *Van Patten* ^{2 3 4}), Cache (*Rogers*).

The first specimen of this *Eresia* that reached us was sent by the well-known bird-collector, Carmiol. This is a male, and was described in 1869. Three years subsequently Mr. Butler described ² and afterwards figured ³ the female as *E. dimorphina*. We have both types now in our possession, and also a good series of both sexes sent us by Mr. Rogers; and we have no doubt as to the two insects being male and female of one species.

In the shape of its wings *E. nigripennis* comes nearest to *E. phillyra*, but it is not remotely allied to *E. alsina*. The primary wings of the male being wholly black to the base, and the spots in the apical part of the wing being small and indistinct, at once separate it from its allies.

The insect figured is the type of *E. nigripennis*; that called the female on the plate we now find to belong to another species, as will be seen below.

8. ***Eresia eutropia*.** (*E. dimorphina*, Tab. XX. figg. 17, 18; Tab. XXI. fig. 1.)
Eresia eutropia, Hew. Ent. Monthl. Mag. xi. p. 56 ¹.

E. nigripenni similis, sed alis anticis minus elongatis nec falcatis, maculis in dimidio apicali majoribus et macula fulva ad basin notatis distinguenda; ♀ anticis ad basin fulvis et margine posticarnm latiora diversa.

Hab. PANAMA ¹, Santa Fé (*Arcé*), Lion-Hill station (*M'Leannan*).

A close ally of *E. nigripennis*, which it perhaps represents in the State of Panama. The specimens sent us by M'Leannan (both females) differ from what we take to be the normal female by having all the spots of the primaries white instead of yellow; but, as they are placed in exactly the same positions in both forms, we believe them to be abnormally coloured. More specimens are requisite to determine this point.

Hewitson described this species from a male said to have been taken at Panama ¹, but whether on the line of railway or further westwards we are not informed.

9. ***Eresia coela*.** (Tab. XXI. figg. 2, 3).
Eresia coela, Druce, Ent. Monthl. Mag. xi. p. 37 ¹.

Alis anticis rotundatis fusco-nigris, macula in quatuor partita ultra cellulam, altera in costa apicem propiore tertia infra eam duplici et serie submarginali albescentibus; posticis fulvo-rufis, costa et margine externo nigris, maculis duabus albis ad angulum apicalem et lunulis submarginalibus flavidis notatis: subtus ut supra, maculis omnibus magis distinctis.

Hab. COSTA RICA (*Van Patten* ¹); PANAMA, Veraguas (*Arcé*).

Mr. Druce described this species from a single Costa-Rican specimen, since which time another has reached us from the State of Panama. In this example there is a large spot on the underside of the primaries, in the cell and over the median nervure, only faintly indicated in the type. On the upperside a fulvous patch is indistinctly shown in the same region. Both these specimens are females, the male being unknown at present.

E. cæla seems to be allied to *E. emerantia*, Hew., a Colombian form not found within our limits. There is another allied species in Western Colombia, which has not yet received a name so far as we are aware.

10. *Eresia pæcilina*. (Tab. XX. figg. 19, 20.)

Eresia pæcilina, Bates, Ent. Monthl. Mag. iii. p. 133¹.

Alis anticis fusco-nigris, dimidio apicali frequenter flavo maculato; posticis fulvis, costa et margine externo (ad angulum apicalem late) fusco-nigris, maculis sex submarginalibus alteraque interiore flavis notatis: subtus ut supra, anticis ad basin fulvis, posticarum costa ad basin flava.

Hab. PANAMA, Santa Fé (*Arcé*¹).

A single female specimen is all that we have yet received of this *Eresia*; this formed part of a collection sent us by our collector Arcé, and was taken by him near Santa Fé in the State of Panama. This specimen was described by Mr. Bates in 1866¹.

E. pæcilina has a very close ally in *E. ithomioides*, an insect described by Hewitson from a specimen obtained by Mr. Birchall in Colombia. This has now passed into our possession, and proves to be a male, differing in having a much broader dark outer margin to the secondaries, which, instead of tapering to nothing towards the anal angle, as in *E. pæcilina*, continues as a broad black band to the inner margin.

The homœochromatic associates of *E. pæcilina* are *Tithorea pinthias*, *Mechanitis isthmia*, *Calithomia hezia*, &c.

Our figure is taken from the unique type.

- b.* Wings less elongated than in group *a*; wings of all the species spotted or banded with white or yellowish white; sexes nearly alike in colour.

11. *Eresia myia*.

Eresia myia, Hew. Ex. Butt., *Eresia*, t. 3. ff. 16, 17¹.

Alis nigro-fuscis, anticis macula magna rotunda apud ramum medianum primum, aliisque minoribus ultra cellulam albis; posticis fascia transversa mediana alba: subtus maculis albis ut supra, anticis ad basin ferrugineis, apicibus brunneo et fusco marmoratis; posticis ad basin fusco irroratis, dimidio distali nebuloso, maculis irregulariter notato, lineis undulatis apud marginem externum.

♀. Mari similis, sed major et maculis magis distinctis.

Hab. MEXICO¹, Cordova (*Rümeli*, *Höge*), Oaxaca (*Fenochio*); GUATEMALA, Choctum (*Hague*), Cahabon and Cubilguitz (*Champion*); NICARAGUA, Chontales (*Janson*).

This and the following species are perhaps out of place in this genus, and may have to be removed into *Phyciodes*, to some species of which, both in the markings of the underside and the shape of the outer margins of the primaries, they bear a close resemblance. The wings, however, especially in *E. ofella*, are more elongated than is usual in *Phyciodes*; so we place them in *Eresia* for the present.

E. myia is best distinguished from *E. ofella* by the rufous colour of the base of the

primaries beneath; the white spot near the middle of the inner margin of the primaries is smaller and rounder in the former than in the latter. The range of these two near allies overlaps to a considerable extent; but *E. ofella* has a more southern extension and does not pass beyond Guatemala.

12. *Eresia ofella*.

Eresia ofella, Hew. Ex. Butt., *Eresia*, t. 3. ff. 18, 19¹.

E. myia similis, sed alis anticis paulo magis productis, macula apud marginem internum majore et subtus anticis ad basin griseo-cretaceis nec rufis distinguenda.

Hab. GUATEMALA, forests of Northern Vera Paz and Polochic valley (*F. D. G. & O. S.*), Zapote (*Champion*); COSTA RICA, Cache (*Rogers*); PANAMA, Calobre (*Arcé*), Lion-Hill station (*M^cLeannan*).—COLOMBIA¹; VENEZUELA.

The differences between this species and *E. myia* are given above under that species. In its wide range some slight variation occurs between individuals from extreme points. Southern examples, especially those from Venezuela, are whiter than is usual in specimens from Guatemala; but the difference is hardly of specific value. The type described and figured by Hewitson came from Colombia and formed part of Mr. Birchall's collection¹.

13. *Eresia clara*. (Tab. XX. figg. 21, 22.)

Eresia clara, Bates, Journ. Ent. ii. p. 192¹.

Papilio nauplia, Cr. Pap. Ex. t. 316. ff. D, E² (nec Linn.).

Eresia nauplia, Butl. & Druce, P. Z. S. 1874, p. 350³.

Alis fusco-nigris, anticis maculis quatuor, posticis fascia transversa lata, albis notatis: subtus maculis majoribus, cellula anticarum ad basin flavida, alarum omnium apicibus albis, anticis ad costæ basin margine externo partim et posticis ad marginem externum ferrugineo notatis; posticis ad basin lineis fuscis bifasciatis et linea angusta alba ad angulum analem ornatis.

Hab. GUATEMALA, Polochic valley and Choctum (*Hague*), Central valleys (*F. D. G. & O. S.*¹), Teleman and Panzos (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*³); PANAMA, Chiriqui and Veraguas (*Arcé*), Lion-Hill station (*M^cLeannan*).—COLOMBIA; VENEZUELA; GUIANA²; AMAZONS¹.

As Mr. Bates pointed out¹, this species has usually been confounded with *E. nauplia* (Linn.), with which it associates in the valley of the Amazons and throughout a large portion of its range. Mr. Bates adds that he took both sexes of each species in about equal numbers in the Amazons valley, and found the differences between the two forms quite constant. Both species are figured on plate 46 of Clerk's 'Icones Insectorum': figg. 1, 2 represent the true *E. nauplia*, whilst figg. 3, 4 represent the present species.

In Central America *E. clara* is alone found, the insect called *E. nauplia* by Messrs. Butler and Druce³ belonging here. It has a wide range in the hotter districts from Guatemala southwards.

PHYCIODES.

Phyciodes, Hübner, Verz. bek. Schm. p. 29 (1816).

Melitæa section ii., Doubleday, Gen. Diurn. Lep. p. 181.

The species of this group of Nymphalinae have received very various treatment at the hands of different authors. Doubleday, to whom a comparatively few species were known, places some of them as a second section of the genus *Melitæa*, others under *Eresia*. Hewitson called all the species *Eresia*; and Kirby followed him, substituting Hübner's name *Phyciodes* for the whole group. Strecker, in his 'Catalogue of North-American Butterflies,' on the other hand, includes them under *Melitæa*, whilst Scudder splits them up into a number of different genera.

The tangible points of separation are by no means obvious; and though many of the species may be arranged in groups, others do not lend themselves to such a division, but serve to blend the whole.

We have examined the anal appendages in the males of a considerable number of species, with results which show that our present knowledge of these organs is not sufficiently advanced to enable us to use them in classification. On the whole, these parts in *Phyciodes* resemble those of *Melitæa* (*M. cinxia*) rather than those of *Argynnis* (*A. selene*), inasmuch as the tegumen is, as a rule, somewhat atrophied and devoid of the hook present in *Argynnis*. But, as usual, much variation is present in different species, the harpagones being considerably reduced in *P. drymæa* and short in *P. liriopæ*, whilst *P. leucodesma* has the tegumen more developed, thus resembling some species of *Argynnis*.

The character by which *Phyciodes* can be best distinguished from *Melitæa* is the terminal joint of the palpi, which in the former genus is much more attenuated than in the latter. The tibia of the middle and hind legs of *Phyciodes* are like those of *Melitæa*, the outer surface being smooth and not spiny as in *Argynnis*. The neurulation, too, is essentially that of *Melitæa*, the first subcostal branch of the primaries being thrown off before the end of the cell, and the second after it. The antennæ have 33 joints, the terminal 12 forming an abrupt club. The front legs of the male are slightly hairy, the coxa stout, femur+trochanter > 2 coxa, tibia=femur, tarsus short (single-jointed)= $\frac{1}{3}$ tibia.

So far as the Mexican and Central-American species are concerned, the division of the species into those which have a simply rounded outer margin to the primaries and those in which this margin is sinuated and which possess a distinct prominence near the anal angle, seems to a great extent a natural one. This, at least, is true so far, as the former section includes all the species of the *P. tharos* group, a more northern type whose range does not extend beyond the highlands of Guatemala. The species with the notched wing are of a southern type, the northern extension of which reaches Texas, where *P. texanus* occurs. The group represented by *P. fragilis* and *P. nigrella*,

however, which have a rounded margin to the primaries, are of southern range; but we have as yet failed to find characters by which to separate them from the *P. tharos* section, with which we here associate them.

Though our classification must thus be considered tentative, we believe our determination of the following forty-one species to be correct, so many of the types being in our possession, or having been examined by us at various times.

a. Outer margin of primaries rounded in a simple curve, and without tooth-like projection near the anal angle.

P. cyneas group. A series of yellow spots in a dark band across the secondaries beneath beyond the cell.

1. *Phyciodes cyneas*. (Tab. XXI. figg. 10, 11.)

Phyciodes cyneas, Godm. & Salv. P. Z. S. 1878, p. 269¹.

Alis fuscis, anticis macula cellulari, altera infra eam et seriebus duabus margine externo subparallelis flavis; maculis duabus ad marginis externi medium ferrugineis; posticis fasciis macularum flavarum duabus transvittatis, una per cellulæ finem, altera ultra eam, maculis sex submarginalibus ferrugineis: subtus anticis pallide ferrugineis et sicut in pagina superiore flavo maculatis serie autem apicali addenda; posticis flavis, venis et fascia transversa (maculas sex flavas includente) nigris.

♀. Mari similis, sed major et maculis alarum ferrugineis, majoribus inter fascias flavas quoque ferrugineo notatis.

Hab. MEXICO, Oaxaca (*Fenochio*¹).

This species and the next belong to a group of *Phyciodes* represented in North America by *P. leanira* (Feld.) and *P. fulvia* (Edw.), one of the distinguishing characters of which is a dark band across the secondaries, in which is a series of yellow spots*. From *P. leanira* the present species differs in having a well-defined row of red spots on the secondaries. The bases of the wings are spotless; the costa, too, of the primaries is dark brown, and not rufous as in *P. leanira*. Beneath, the dark marks across the cell of the secondaries are wanting. *P. fulvia* has more elongated primaries than *P. cyneas*, and much more of the rusty-coloured marking on the distal half of the wings.

We know but little of this species: the type, a male which we now figure, from Oaxaca, and two females from some other part of Mexico, are all we have seen.

2. *Phyciodes cynisca*, sp. n. (Tab. XXI. fig. 12.)

P. cyneæ affinis, sed maculis supra ferrugineis nullis, fascia posticarum per cellulæ finem flava multo latiore, et subtus anticarum basi et maculis submarginalibus tantum rufis distinguendus.

Hab. MEXICO, Orizaba (*Sallé*), Jalapa (*Höge*).

We have four specimens of this species which, agreeing with one another, differ in many respects from *P. cyneas*, as shown above. It is, however, nearly allied to that species and to *P. leanira* of California.

* This group, with *P. theona* and *P. ezra*, would go into Mr. Scudder's genus *Thessalia* (Bull. Buff. Soc. N. H. ii. p. 265).

P. theona group. A broad yellow or whitish band across the end of the cell of the secondaries beneath.

3. *Phyciodes theona*.

Melitæa theona, Ménétr. En. Corp. An. Mus. Petr. p. 86, t. 2. f. 5¹; Strecker, Cat. Butt. N. Am. p. 126².

Alis fuscis, anticis maculis duabus in cellula, altera infra eam, septem in serie undulata marginem propioribus et una ad medium marginis externi flavidis, maculis ad angulos apicales et anales ferrugineis quoque notatis; posticis fascia (venis divisa) per aream mediam flavida, maculis in serie submarginali positibus rufis, interdum altera exteriore flava: subtus anticis plerumque rufis, maculis paginae superioris bene notatis sorieque altera submarginali ornatis; posticis maculis basalibus, fascia mediana et altera submarginali argenteo-albidis, inter fascias fuscis rufo notatis.

Hab. NORTH AMERICA, California, Texas².—MEXICO, Palmarito (*Forrer*), Oaxaca (*Fenochio*), Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Yzabal (*F. D. G. & O. S.*), Polochic valley, Chisoy valley, and San Gerónimo (*Hague*), Tamahu, San Juan in Vera Paz, and Cahabon (*Champion*); NICARAGUA, Chontales (*Belt*).

A common species in Southern Mexico and Guatemala, but becoming more rare in Nicaragua, whence the original specimen was procured, and whence we also have an example. It also ranges northwards across the Mexican frontier into California and Texas. In Guatemala it is a lowland species, inhabiting districts lying between the sea-level and 3000 feet above it. We have no indication of its existence on the western or Pacific side of the country.

The figure of *P. theona* given by Ménétrié is quite recognizable; but the inner of the two bands of the secondaries is more rufous than is usual in Guatemala examples, and not so yellow; but some of our specimens are quite like the figure.

4. *Phyciodes ezra*.

Eresia ezra, Hew. Ex. Butt., *Eresia*, t. iv. fig. 29¹.

Eresia yorita, Reak. Proc. Ent. Soc. Phil. v. p. 224².

Alis nigro-fuscis, anticis macula in cellula, altera infra eam majore, ramo mediano primo divisa, et fascia transversa maculosa ultra cellulam flavidis; posticis fascia lata transversa, venis divisa, per cellulæ finem quoque flavida: subtus ut supra, costæ anticarum basi, posticarum basi, maculis anticarum apicalibus rufis; posticis ad basin flavo maculatis, fascia duplici submarginali exteriore albida, interiore rufa notatis.

Hab. HONDURAS²; PANAMA, Bugaba and Calobre (*Arcé*).

This species, which seems to replace *P. theona* in the State of Panama, was described by Hewitson from a specimen of unknown locality. We have since received a number of specimens, all from the State of Panama, where it appears to be common.

These Panama specimens all undoubtedly belong to the form described by Reakirt as *P. yorita*, a name based upon a specimen without spots at the base of the secondaries. As we notice a trace of these in some of our examples, we do not attach any importance to the character. Reakirt's specimen is said to have come from Honduras.

P. tharos group. Wings above more or less mottled with fulvous spots.

5. *Phyciodes tharos*.

Papilio tharos, Drury, Ill. Nat. Hist. i. p. 43, t. 21. ff. 5, 6¹.

Melitæa tharos, Strecker, Cat. Butt. N. Am. p. 120².

Phyciodes tharos, W. H. Edw. Butt. N. Am. *Phyciodes*, t. 1, 2³.

Alis fuscis, maculis fulvis (marginibus exceptis) notatis; subtus fulvis, posticis magis ochraceis fusco præcipue ad marginem externum variegatis.

Hab. NORTH AMERICA generally, east of the Rocky Mountains², New York¹, Texas³.
—MEXICO.

We have one specimen of this species from Mexico, which was formerly in Mr. Bates's collection, and is, though rather dark on the upperside, much like the form of *P. tharos* represented by *P. morpheus*.

We have no other record of the species within our limits, though it occurs on the north-eastern frontier in Texas.

Mr. W. H. Edwards's observations on the development of this species and the influence of temperature on the developing imago are worthy of careful study in connexion with the members of this genus. We should not be surprised to find that some unexpected relationship between some of the insects now supposed to be distinct species would be revealed were similar observations made upon them. This of course can only be done by a naturalist resident in the country where they live.

6. *Phyciodes picta*. (Tab. XXI. figg. 4, 5.)

Phyciodes picta, W. H. Edw. Proc. Ent. Soc. Phil. iv. p. 201¹.

Melitæa picta, Strecker, Lep. Rhop.-Het. p. 65, t. 8. f. 10².

Alis fuscis, maculis fulvis et flavidis notatis fere ut in *P. phaonte*; subtus flavis, anticis maculis paucis notatis, posticis fere immaculatis.

Hab. NORTH AMERICA, Nebraska, Colorado, Arizona^{1 2}.—MEXICO².

We are indebted to Mr. Strecker for a Mexican specimen (which we figure) of this species, by no means a common one in the South-western States of America, where it was originally discovered.

The nearly pure yellow secondaries beneath is a characteristic feature of this species.

7. *Phyciodes orseis*.

Phyciodes orseis, W. H. Edw. Trans. Am. Ent. Soc. iii. p. 206¹.

Melitæa pratensis, var. *orseis*, Strecker, Cat. Butt. N. Am. p. 121².

Alis fuscis, fulvo maculatis, posticis fascia fulva submarginali notatis: subtus anticis ad basin fulvis ochraceo indistincte notatis, ad marginem externum fusco variegatis et maculis argenteis apicalibus ornatis; posticis rufescente fusco variegatis, maculis ad basin, una ad medium marginis externi et linea transversa bicurvata ultra cellulam argenteis.

♀. Mari similis, posticis magis fulvo ornatis.

BIOL. CENTR.-AMER., Rhopal., Vol. I., August 1882.

Hab. NORTH AMERICA, Sierra Nevada^{1 2}.—MEXICO, Milpas in Durango (*Forrer*), Cordova and Jalapa (*Höge*).

Mexican specimens agree very closely with Californian, offering no tangible differences by which to separate them. All our examples are fairly constant in their characters; but a specimen from Milpas in Durango, sent us by Mr. Forrer, is more fulvous above than any of the specimens from Cordova &c.

P. orseis is closely allied to *P. pratensis* of California, so much so that some authors treat it as a variety of that insect². As our Mexican specimens agree with the true *P. orseis* rather than with *P. pratensis*, we place them under the former name.

8. *Phyciodes thebais*. (Tab. XXI. figg. 13, 14 ♂, 15 ♀.)

Phyciodes thebais, Godm. & Salv. P. Z. S. 1878, p. 267¹.

Alis fuscis, maculis sordide albidis notatis, in posticis fasciam mediam curvatam formantibus; subtus *P. orseidi* simillimus.

Obs. A *P. orseide* maculis alarum paginae superioris pallidis nec fulvis, colore quoque fulvo posticarum fere absente distinguendus.

Hab. MEXICO, Oaxaca (*Fenochio*¹); GUATEMALA, Dueñas¹ and Volcan de Fuego (*F. D. G.* & *O. S.*), Calderas, Chilasco (*Champion*).

This species belongs to the same group of the genus as *P. pratensis*, Behr, and is closely allied to *P. orseis*, Edw., of California, itself considered by some American writers to be but a variety of *P. pratensis*. From both these forms the males of *P. thebais* can be recognized by the spots being much paler and, as a rule, smaller. There is too in the males hardly a trace of the band of fulvous on the secondaries, which is conspicuous in *P. orseis*, and includes a row of black spots. The females in all these forms are practically undistinguishable. Of the first specimens we obtained of *P. thebais*, one came from Oaxaca, and another from Dueñas in Guatemala; since then Mr. Champion has sent us a good supply of specimens, mostly taken at Calderas, on the slopes of the Volcan de Fuego, at an elevation of about 7000 feet; other specimens were obtained in Vera Paz, in the high mountain-district above San Gerónimo.

We have figured Calderas specimens, in fresher condition than either of the types.

9. *Phyciodes boucardi*. (Tab. XXI. figg. 16; 17.)

Phyciodes boucardi, Godm. & Salv. P. Z. S. 1878, p. 268¹.

P. orseidi similis, sed minor, alis magis rotundatis et maculis ad basin alarum magis distinctis; subtus alis undique ochraceo-fulvis, posticis fere unicoloribus lineis indistinctis notatis, macula ad modum marginis externi fusca, maculis argenteis *P. orseidis* absentibus.

Obs. Quoad staturam et formam alarum *P. vestæ* similis, sed colore posticarum paginae inferioris differt.

Hab. MEXICO, Putla (*Rébouch*¹), Cordova (*Rümeli*).

This is one of a group of small species having a general resemblance to *P. pratensis*

and its allies, but with rounder wings, and the spots more evenly distributed over the surface of the wings. The colour of the underside of the secondaries is one of the chief distinguishing characters of *P. boucardi*. This is best seen by reference to the Plate, where the type is represented.

A single example obtained by M. Rébouch at Putla, in Western Mexico, which we now figure, was for some time the only one we possessed. Several others have since come into our hands from the collection made by Rümeli near Cordova.

There appears to be great probability that *P. boucardi* is a seasonal form of *P. vesta*, as it much resembles the summer form of that species, as represented by Mr. W. H. Edwards (Butt. N. Am. *Phyc.* t. 2. figg. 18, 19); but we think it best to keep *P. boucardi* apart for the present, until reared specimens prove its actual position.

10. *Phyciodes vesta*.

Phyciodes vesta, W. H. Edw. Trans. Am. Ent. Soc. ii. p. 371 (1869)¹; Butt. N. Am. *Phyciodes*, t. 2. ff. 18-21².

Melitæa vesta, Strecker, Cat. Butt. N. Am. p. 120³.

Eresia graphica, R. Feld. Verh. k.-k. zool.-bot. Ges. Wien, 1869, p. 470⁴.

P. boucardi persimilis et ejusdem formæ, colore magis obscuro posticarum paginæ inferioris differt.

Obs. Forsan forma hiemalis *P. boucardi*.

Hab. NORTH AMERICA, Texas^{1 2 3}.—MEXICO, Huahuapan (*Hedemann*⁴), Cordova (*Rümeli*); GUATEMALA, San Gerónimo (*Hague*).

Mexican and Guatemalan specimens of this species are rather darker on the upper surface than the ordinary Texan examples of it, of which we have a fair series from our North-American friends.

Our single Guatemalan specimen we took to Vienna some years ago, and comparing it with the type of *P. graphica* found them agree, showing that this name and *P. vesta* are synonymous. Which of the two names was first published cannot now readily be determined; but we use Mr. Edwards's title on account of its having become current in the literature of North-American butterflies.

In Mr. Edwards's work² will be found an excellent account of this species.

11. *Phyciodes pallescens*. (Tab. XXI. figg. 18, 19.)

Eresia pallescens, R. Feld. Verh. k.-k. zool.-bot. Ges. Wien, 1869, p. 469¹.

P. vestæ et *P. boucardi* similis, sed anticis magis elongatis fere sicut in *P. pallido*, Edw., macula magna anticarum extra cellulam costam attingente et iis inter ramos medianos quam reliquæ paulo magis flavescentibus; subtus anticis vix nigro maculatis, sed pallide fusco notatis, posticis sordide ochraceis fusco indistincte marmoratis.

Hab. MEXICO, Puebla (*Hedemann*¹), Oaxaca (*Fenochio*).

We have compared a Mexican specimen in our collection with the type of *P. pallescens* in the Vienna Museum. The species is a somewhat obscure one; and we should not be

surprised to find that its relationship to the North-American *P. phaon* and its allies is closer than we are able to trace at present with the scanty material before us.

We have figured a male from Oaxaca, Mexico.

12. *Phyciodes elada*. (Tab. XXI. figg. 6, 7.)

Eresia elada, Hew. Ex. Butt. *Eresia*, t. 7. ff. 54, 55¹.

Eresia socia, R. Feld. Verh. k.-k. zool.-bot. Ges. Wien, 1869, p. 470².

P. vestæ et *P. boucardi* quoad alarum paginam superiorem valde similis, sed subtus valde distinctus, anticis fuscis fulvo maculatis, posticis fasciis tribus nigro marginatis, una basali, altera per cellulæ finem, altera lunulosa submarginali, inter has maculis fulvis nigro marginatis ornatis.

Hab. MEXICO¹ (*Deppe*, *Hedemann*²), Palmarito (*Forrer*), Oaxaca (*Fenochio*).

Hewitson's figure of *P. elada* represents an insect with smaller spots than the specimens we attribute to this species, which agree, in fact, with the type of *P. socia*², with which we have compared the specimen from Oaxaca we now figure. As some variation is present in the specimens in our collection, and as still more may be reasonably looked for in a larger series, we are unwilling to admit the distinctness of *P. socia* from *P. elada*. It remains a question whether *P. imitata* will not hereafter prove to belong to the same species. So few specimens have come into our hands, and we have seen so few in other collections, that we hardly feel in a position to speak positively on the value of these names.

13. *Phyciodes imitata*. (Tab. XXI. figg. 8, 9.)

Melitæa imitata, Strecker, Lep. Rhop.-Het. p. 130¹; Cat. Butt. N. Am. p. 189².

Melitæa ulrica, W. H. Edw. Can. Ent. ix. p. 189³.

P. eladæ valde similis, sed maculis omnibus fulvis paginæ alarum superioris subæqualibus et multo majoribus distinguendus.

Hab. NORTH AMERICA (*Texas*^{1 3}).—MEXICO, Cordova (fide *Strecker*).

This species was described by Messrs. Strecker and W. H. Edwards about the same time from Texan specimens under different names, their identity being shown by Mr. Strecker in the Appendix to his Catalogue of North-American Butterflies¹. Our acquaintance with the species is due to the kindness of Mr. Strecker, who sent us a specimen from Cordova, Mexico, which we now figure.

P. imitata obviously belongs to the same group as *P. elada*; and the only doubt we have respecting it is whether it may not prove to be an extreme form of that species. A good series of specimens is necessary to determine this point.

Another near ally of *P. elada* is *P. larunda* (Strecker) = *P. dymas*, W. H. Edwards, also a Texan species, of which we have a specimen from Arizona sent us by Mr. Henry Edwards. This, too, most probably occurs within our limits.

It differs from *P. elada* in having black spots on the basal half of the secondaries beneath, as well as other characters.

P. leucodesma group. Secondary wings, except the outer margin, and base and middle of inner area of primaries white.

14. *Phyciodes leucodesma*.

Eresia leucodesma, Feld. Wien. ent. Monatschr. v. p. 103¹; Reise d. Nov. Lep. p. 394, t. 50. ff. 11, 12².

Eresia cincta, W. H. Edw. Proc. Ent. Soc. Phil. ii. p. 502³.

Alis fuscis, macula magna a margine interno ad ramum discocellularem inferiorem, altera elliptica supra eam costam attingente, una minuta in cellula et aliis ad apicem albis; posticis præter basin et marginem externum albis: subtus ut supra anticarum basi flavida, maculis albis ad apicem et margine externo; posticarum basi et apice albis, serie macularum nigrarum submarginalium ornatis.

♀. Mari fere omnino similis.

Hab. NORTH AMERICA, Texas³, Florida³.—NICARAGUA, Chontales (*Belt*); PANAMA, David (*Champion*), Volcan de Chiriqui (*Arcé, Champion*), Calobre (*Arcé*), Lion-Hill Station (*McLeannan*).—COLOMBIA²; VENEZUELA¹; TRINIDAD.

We can see no tangible difference between a Texan specimen (the *P. cincta* of Edwards) and our series from Venezuela and Trinidad (the *P. leucodesma* of Felder). It is, however, a remarkable fact that a wide gap, including the whole of Mexico and Central America as far as Nicaragua, occurs in the range of the species. Here, and through Costa Rica and the State of Panama, *P. leucodesma* is common.

Mr. Champion has sent us paired specimens of this species, showing that the sexes are almost exactly alike.

P. fragilis group. Primary wings and secondaries internally for the most part plain fulvous.

15. *Phyciodes anieta*. (Tab. XXI. fig. 20.)

Eresia anieta, Hew. Ex. Butt. *Eresia*, t. 6. f. 43, 44¹.

Phyciodes claudina, Butl. & Druce, P. Z. S. 1874, p. 348² (nec Eschscholtz).

Alis fulvis, anticis ad basin costæ, apice, margine externo et linea a costa ad marginem externum ducta fusco-nigris, posticis ad basin et margine externo fusco-nigris; subtus fulvis anticarum regione apicali et posticis omnino fusco-ochraceo marmoratis.

Hab. GUATEMALA, Polochic valley (*F. D. G. & O. S.*), Tamahu and Purula (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*²), San Francisco and Cache (*Rogers*); PANAMA, Chiriqui (*Arcé, Champion*), Calobre (*Arcé*).—COLOMBIA; VENEZUELA¹; ECUADOR; PERU; BOLIVIA.

The type of this species came from Venezuela¹, whence we also have an example, only differing from Hewitson's figure in having the apical fulvous spot of the primaries rather more isolated, the black transverse band being more distinct. With our Venezuelan example we have a number from Costa Rica and the State of Panama agreeing in every respect. The Guatemalan insects we place here with some diffidence, as the base of the wings is much more broadly black, as is also the outer border of the

secondaries, and specimens are larger. A Panama specimen, however, agrees with these, others from the same locality being of the normal type. The Nicaragua examples are small, the tawny colour paler, and the primaries are rather more pointed. These, too, can be matched in our series from Panama.

The specimen from Mr. Druce's collection, called *P. claudina*², seems certainly to belong here. The name *P. claudina* is synonymous with *P. flavia*, and applies to a Brazilian species.

In Guatemala *P. anieta* ranges to a height of about 4000 feet at Purula, but it seems restricted to the valley of the Polochic.

We have figured a male from Costa Rica.

16. **Phyciodes cluvia**, sp. n. (Tab. XXI. figg. 21, 22.)

P. anietae affinis et ejusdem stature, alarum marginibus et basi multo latius nigris; subtus valde fusciscentioribus, anticis maculis duabus ochraceis, una magna in regione rami mediani, altera fasciiformi extracellulam.

Hab. GUATEMALA, Purula and Cerro Zunil (*Champion*).

We base this species upon two specimens obtained by Mr. Champion in the above localities. On the upper surface it much resembles the Guatemala form of *P. anieta*; but the black borders are still broader. Beneath it differs in having the wings (except the region of the median branches and a transverse band across the apex) of a ferruginous brown instead of tawny.

It would appear to be an inhabitant of damp highland districts, ranging between 4000 and 6000 feet.

We have figured the specimen from Purula.

17. **Phyciodes fragilis**. (Tab. XXI. fig. 23.)

Melitæa fragilis, var. *guatemalena*, Bates, Journ. Ent. ii. p. 189¹.

P. anietae quoque affinis, sed plerumque major; alis dilutius fulvis, marginibus alarum nigris multo angustioribus, macula anticarum apicali fulva haud fascia fusca separata.

Hab. MEXICO, Cordova (*Rümeli*), Jalapa (*Höge*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, interior (*F. D. G. & O. S.*), Las Nubes (*O. S.*), Choctum, San Gerónimo, Polochic valley (*Hague*), Zapote, Las Mercedes, Cahabon and Teleman (*Champion*); HONDURAS, San Pedro (*G. M. Whitely*).—COLOMBIA; VENEZUELA; LOWER AMAZONS¹; S. BRAZIL.

This species, as Mr. Bates has pointed out, is allied to *P. liriopæ*, a common butterfly in Guiana and many parts of the Amazon valley. The typical form of *P. fragilis* was obtained by Mr. Bates on the banks of the Cupari, a branch of the Tapajos. At the time he described it he referred our Guatemalan examples to a local race of the same insect as var. *guatemalena*. Since then we have received a large series of specimens which show that the differences between the Cupari insect and those from Central

America are not always obvious. One of the chief differences in *P. guatemalena* is the narrowness of the dark border to the secondaries, which in some cases is obsolete. This is seen in Mexican examples. In San-Gerónimo specimens the fulvous colour of the wings is pale, and in this respect resembles that of the Brazilian *P. flavia*, but the distinct marks of the apex of the primaries are wanting. The wings of specimens from localities on the Pacific side of the mountains of Guatemala are darker, and have a broader border, than the true *P. fragilis* itself.

The range of this species is somewhat singular; for it is very common in Guatemala up to an elevation of about 3000 feet; we get it again in Honduras; but between this point and the continent of South America the allied form *P. anieta* takes its place.

We have figured a male from Teleman, in the Polochic valley, a specimen in better condition than the types.

P. nigrella group. Wings either wholly brownish black or marked internally each with a large median white or yellowish-white spot.

18. *Phyciodes nigrella*. (Tab. XXI. figg. 24, 25 ♂, 26 ♀.)

Melitæa nigrella, Bates, Ent. Monthl. Mag. iii. p. 133¹.

Alis fusco-nigris interdum immaculatis, interdum macula anticarum submediana, aliis duabus subapicalibus et fascia per medium posticarum indistincte ochraceis fere obsoletis; subtus sordide ochraceis fusco marmoratis, anticis ad costam et fascia transversa per cellulæ finem fuscis.

♀. Mari similis, sed major, et maculis anticarum et fascia posticarum ochraceis bene definitis.

Hab. GUATEMALA, San Gerónimo (*F. D. G. & O. S.*¹, *Champion*).

Mr. Bates described this curious species from specimens obtained by us near San Gerónimo in Guatemala, in which locality Mr. Champion has also recently found it in some numbers; but it seems to have a very restricted range. There is a certain amount of variation in individual specimens of this species: in some the wings above are almost of a uniform brownish black; in others a yellowish spot on the median branches of the primaries and a band across the middle of the secondaries are faintly indicated. These marks in the female are quite distinct.

We have figured specimens from San Gerónimo, Guatemala.

19. *Phyciodes lutescens*, sp. n.

P. nigrellæ valde affinis, sed in sexibus ambobus maculis alarum bene definitis et in mare hujus speciei sicut in femina *P. nigrellæ*.

♀. Maculis anticarum et fascia transversa posticarum multo magis distinctis, *P. anietæ* approximans.

Hab. GUATEMALA, Las Nubes (*O. S.*), Cerro Zunil, Purula, and San Gerónimo (*Champion*).

A form closely allied to *P. nigrella*, and perhaps only an extreme variety of it. The males, however, have distinct yellow spots on the primaries and a band on the

secondaries, being, in fact, as distinctly marked as the females of *P. nigrella*. We think, too, that in all probability *P. lutescens* is found in a rather higher range of country. Like its ally it is very local, but has been found in the widely separated districts of Purula and the slopes of the Cerro Zunil. At present we have only seen five specimens, four males and one female.

20. *Phyciodes niveonotis*. (Tab. XXI. fig. 27.)

Phyciodes niveonotis, Butl. & Druce, Cist. Ent. i. p. 100¹; P. Z. S. 1874, p. 348².

P. nigrellæ et *P. lutescenti* affinis, sed maculis anticarum et fascia posticarum albis nec ochraceis distinguendus; alarum pagina inferiore grisea quoque differt.

Hab. COSTA RICA (*Van Patten*^{1 2}), Cache (*Rogers*).

Described from a single rubbed specimen in Van Patten's Costa-Rica collection¹. Since then we have received a good series from Mr. Rogers, most of them in good condition, one of which we have figured. *P. niveonotis* is obviously allied to *P. nigrella* and *P. lutescens*, differing from the latter in having the yellow markings of the wings replaced by white. Like its allies it, too, appears to have a very restricted range.

b. Outer margin of primaries sinuated, with a distinct tooth-like prominence near the anal angle.

a'. Scales of secondaries above normal.

P. poltis group. A tawny spot at the costal end of the transverse band of the secondaries.

21. *Phyciodes poltis*. (Tab. XXI. figg. 28, 29.)

Phyciodes poltis, Godm. & Salv. Ann. & Mag. N. H. ser. 5, ii. p. 261¹.

Alis fuscis, anticis maculis paucis fulvis notatis, una ad cellulæ finem, altera ultra eam, una intra ramos medianos et una infra eam, posticis fascia transversa flavido-albida macula fulva ad finem costalem; subtus rufescenti-fuscis, anticis fulvo tinctis, posticis fascia media albida serie punctorum alborum infra eam.

Hab. MEXICO¹.

Of this species we have as yet only seen the type, which was formerly in Mr. Druce's collection, and was supplied to him by M. Boucard. Its nearest ally seems to be *P. orthia* (Hew.) of Brazil and Paraguay.

P. texana group. Base of the primaries beneath rich ferruginous red.

22. *Phyciodes texana*.

Melitæa texana, W. H. Edw. Proc. Ent. Soc. Phil. ii. p. 81¹; Strecker, Cat. Butt. N. Am. p. 119².

Eresia smerdis, Hew. Ex. Butt. *Eresia*, t. 5. ff. 33, 34³.

Alis fusco-nigris, anticis maculis albidis notatis, duabus in cellula, aliis extra eam, duabus intra ramos

medianos, aliis fasciam transversam valde irregularem formantibus; posticis fascia maculosa ultra cellulam et altera lunulosa submarginali albidis: subtus anticis dimidio basali ferrugineo, dimidio apicali nigricante maculis variis notato; posticis fascia albida indistincte notata, alarum reliquo griseo et fusco maculis variis irrorato.

♀. Major et alarum basi maculis ferrugineis notata.

Hab. NORTH AMERICA, Texas ¹, Florida ².—MEXICO ², Acatlan (*Hedemann*), Ventanas and Milpas (*Forrer*), Oaxaca (*Fenochio*).

This is a common species in Texas and some of the other southern States of North America. In Mexico it appears to be less frequent, though it occurs in the southern parts of the country. In Guatemala its place seems to be taken by the next species, which is restricted to a limited district in the high mountains of Vera Paz. An allied species in South America is *P. hera*, which is found in South Brazil and the Argentine Republic. *P. texana* and its allies may easily be recognized by the base of the primaries beneath being of a rich rusty red.

The butterfly described by Hewitson, from an unknown locality, as *Eresia smerdis* ³ is evidently the same as *P. texana*.

23. *Phyciodes sitalces*, sp. n. (Tab. XXI. figg. 30, 31.)

P. texanae forsā affinis, sed alis brevioribus, posticis fascia maculosa transversa vix notatis; subtus posticis valde ferrugineis, linea alba transversa absente.

Hab. GUATEMALA, Chilasco (*Champion*).

We only know this species from specimens sent us by Mr. Champion from the Santa Cruz or Chilasco district of Vera Paz. He there found it not uncommon at an elevation of about 6000 feet above the sea. Its chief difference from *P. texana* consists in the band of spots on the secondaries being almost obsolete. The secondaries beneath, too, have a more rufous tinge.

P. ptolyca group. Marks at the base of the wings indistinct; bands of the secondaries tawny or buff and continuous.

24. *Phyciodes ptolyca*. (Tab. XXI. figg. 32, 33, 34, 35, 36.)

Melitæa ptolyca, Bates, Ent. Monthl. Mag. i. p. 81 ¹.

Melitæa alethes, Bates, loc. cit. p. 82 ².

Melitæa stesilea, Bates, loc. cit. p. 82 ³.

Melitæa lelex, Bates, loc. cit. p. 81 ⁴.

P. texanae similis quoad alarum paginam superiorem, sed maculis et fasciis omnibus fulvescentioribus; subtus anticis ad basin flavidis plus minusve lineolis variolatis, posticis valde instabilibus, aliquando maculis distinctis notatis, aliquando ferrugineis fusco indistincte irroratis.

♀ plerumque major, maculis fascisque fulvis majoribus.

Hab. MEXICO (*Boucard*), Palmarito (*Forrer*), Cordova (*Rümeli*), Yucatan (*Hedemann*); BIOL. CENTR.-AMER., Rhopal., Vol. I., August 1882.

BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA³, Chisoy and Polochic valleys, Choctum (*Hague*), central valleys (*F. D. G. & O. S.*^{1 2}), Dueñas (*F. D. G. & O. S., Champion*), San Gerónimo (*F. D. G. & O. S., Champion*), Panima, Chiacam, and San Juan in Vera Paz (*Champion*); PANAMA, Calobre (*Arcé*), Lion Hill (*M^cLeannan*⁴).—VENEZUELA; ECUADOR².

When we first submitted the comparatively small series of this form of *Phyciodes* to Mr. Bates, on our return from Guatemala in 1863, he considered that they were separable into five species. The large additional materials which have since come into our hands now show us that the lines of demarcation between at least four of these forms are obliterated; and therefore we have no alternative but to unite them under one name. At the same time, we have thought it desirable to figure a typical example of each of Mr. Bates's species, to show more clearly what they are than can be expressed in words.

The characters are chiefly to be sought on the underside of the wings.

The typical form of *P. ptolyca* is represented on Plate XXI. (figg. 32, 33) and described above. This is a common form throughout Guatemala, and we have many specimens from the highlands near Dueñas and from San Gerónimo; but the variety *P. stesilea* (represented by fig. 36) occurs, but in very sparing numbers, in both localities. The variety *P. alethes* also occurs at Dueñas; but we have not yet seen specimens from any other part of Central America, though it is found in Venezuela and Ecuador. This variety is represented by fig. 35.

The variety *P. lelex*, represented by fig. 34, appears to be commoner in Mexico than in Guatemala, and it is also the only one of this form found in the State of Panama.

These varieties are connected together by insensible degrees, and there seems to be no stability in the very indefinite markings of the underside by which to distinguish them. Nor do the sinuations of the outer margin of the primaries offer a better result.

As regards the distribution of the species as a whole, it is worthy of remark that it seems to be entirely absent from Nicaragua, Costa Rica, and the district of Chiriqui, where, as far as the two latter countries are concerned, other members of the genus amply supply its place.

The careful observations of Mr. W. H. Edwards on *P. tharos* and its allies, which have led to such remarkable discoveries as regards the seasonal broods of that species, remind us that some similar influence may be at work in the case of the present insect, and that the broods of the wet season and of the dry season may be so different as to account for the extreme variation observed. This question can only be settled by an entomologist working in the country where *P. ptolyca* is found, and raising successive broods over a considerable period of time.

25. **Phyciodes tulcis.** (Tab. XXII. figg. 1, 2.)

Melitæa tulcis, Bates, Ent. Monthl. Mag. i. p. 82¹.

Eresia archesilea, R. Felder, Verh. k.-k. zool.-bot. Ges. Wien, 1869, p. 471².

P. ptolyce persimilis, sed maculis fasciisque alarum supra fere albidis nec fulvis: subtus anticis ad basin flavido-albis; posticis sordide albis, plaga magna irrorata ad medium marginis externi.

♀. Major, maculis fasciisque magis distinctis.

Hab. MEXICO, Ventanas (*Forrer*), Cordova (*Hedemann*², *Rümeli*), Vallodolid in Yucatan (*Gaumer*); GUATEMALA, central valleys (*F. D. G. & O. S.*¹), San Gerónimo and Zapote (*Champion*), Polochic valley (*Hague*); HONDURAS, San Pedro (*G. M. Whitely*); NICARAGUA, Chontales (*Belt, Janson*); PANAMA, Calobre (*Arcé*).

A closely allied species to *P. ptolyca*, but differing from it in all its varied forms in having the spots and bands of the upper surface pale buff instead of tawny. On the underside the wings are pale drab, the basal half of the primaries being yellowish, and the dark marks of the secondaries concentrated in a patch on the middle of the outer margin.

The range of *P. tulcis* is extensive; but it appears to be more common in Mexico and Guatemala than elsewhere. We have not yet seen any specimens from Costa Rica.

Regarding *Eresia archesilea*², we examined the type in the Vienna Museum, and on comparing it with an example of *P. tulcis* we found them identical.

Our figure represents a specimen from the Polochic valley.

P. frisia group. Marks at the base of the wings distinct.

26. **Phyciodes frisia.** (Tab. XXII. fig. 6.)

Melithæa frisia, Poey, Cent. Lep. Cub. p. 9, t. 2¹.

Melitæa frisia, Strecker, Cat. Butt. N. Am. p. 119².

Eresia gyges, Hew. Ex. Butt., *Eresia*, t. 6. f. 45, 46³.

Alis fuscis, anticis usque ad basin fulvo maculatis, posticis ad basin fulvo maculatis, fasciis tribus submarginalibus fuscis, intima latissima; subtus anticis fuscis, ad basin et maculis apicalibus fulvis, posticis fulvis fusco vix variegatis.

Hab. NORTH AMERICA, Florida².—PANAMA.—COLOMBIA; VENEZUELA; ANTILLES, Cuba¹, Jamaica³, Haiti.

Of this species we have a single specimen from Panama, but without any information concerning the collector. It may well occur there, as we have well authenticated specimens from Santa Marta in Colombia and from Venezuela, where it appears to be a not uncommon insect. These do not differ in any essential particulars from Antillean examples, which must be referred to the *M. frisia* of Poey.

We have figured our Panama example.

P. ardys group. Bands of secondaries broken into spots in the male, evanescent or absent.

27. *Phyciodes ardys*. (Tab. XXII. figg. 3, 4 ♂, 5 ♀.)

Eresia ardys, Hew. Ex. Butt., *Eresia*, t. 5. f. 35, 36¹.

Phyciodes ardys, Butl. & Druce, P. Z. S. 1874, p. 348².

Alis fuscis, anticis fere ut in *P. texana* flavido maculatis, posticis fasciis tribus submarginalibus notatis, intima in maculis fracta, externa lunulosa; subtus anticis sicut in *P. ptolyca*, posticis ferrugineis fusco irregulariter marmoratis.

Hab. MEXICO¹, Cordova (*Rümeli*); COSTA RICA (*Van Patten*²), Cache, San Francisco, and Irazu (*Rogers*).

Originally described from Mexican specimens¹, where it is not uncommon. In Guatemala it has not yet been noticed, its place being probably taken by *P. subota*. In Costa Rica it is quite abundant at elevations varying from 2000 to 4000 feet.

Two specimens from Mexico vary considerably from the ordinary type; the spots of the upper surface are white, without any tinge of yellow; beneath they are paler, and have the markings of the secondaries distinct and not suffused, as usual in *P. ardys*. With so few specimens of this form before us, we hardly think it expedient to describe them under another name.

Our figure is taken from a male captured by Herr Höge at Cordova, Mexico.

28. *Phyciodes hermas*.

Eresia hermas, Hew. Ex. Butt., *Eresia*, t. 5. f. 32¹.

Melitæa hermas, Strecker, Cat. Butt. N. Am. p. 119².

Eresia genigueh, Reak. Proc. Ent. Soc. Phil. v. p. 225³.

P. ardys valde similis, sed maculis alarum paginæ superioris albis et subtus multo pallidioribus et maculis magis distinctis forsitan distinguendus.

Hab. MEXICO², Cordova (*Rümeli*).

Hewitson originally described this insect from specimens in the British Museum¹, but gave no locality for it. We have since received two specimens from Mexico and seen others. Reakirt gives Los Angeles in California as the origin of the type of his *E. genigueh*; but this statement requires confirmation. According to Mr. Strecker, this name is a synonym of *P. hermas*.

29. *Phyciodes subota*. (Tab. XXII. figg. 7, 8.)

Phyciodes subota, Godm. & Salv. P. Z. S. 1878, p. 268¹.

P. ardys affinis, sed lineis posticarum submarginalibus fere obsoletis, alarum basi unicolori fusco-nigra; subtus posticis purpureo-cinereo nec ferrugineo lavatis.

Hab. GUATEMALA, Polochic valley (*F. D. G. & O. S.*¹, *Hague*), Purula, Panima, and Sinanja (*Champion*); COSTA RICA, Irazu (*Rogers*¹).

A species on the upperside very similar to *P. ardys*; but the narrow submarginal

lines of the secondaries are obsolete, and the base of the primaries is quite uniform brownish black. Beneath, the general colour is dark grey instead of ferruginous.

P. subota is not uncommon in the valley of the Polochic in Guatemala, up to an elevation of about 4000 feet; but we have not seen it from anywhere else in that country. From Costa Rica we have only two specimens; these are somewhat aberrant, the cross band of the secondaries being narrower and the base of the wings beneath darker.

We have figured one of the types from the Polochic valley, Guatemala.

30. *Phyciodes drymæa*. (Tab. XXII. figg. 9, 10.)

Phyciodes drymæa, Godm. & Salv. P. Z. S. 1878, p. 268¹.

P. ardys quoque similis, sed supra fascia maculosa posticarum transversa fere obsoleta; subtus maculis omnibus valde indistinctis obscure griseo-fuscis, fusco irroratis.

Hab. GUATEMALA, Las Nubes (*O. S.*¹), Chisoy and Polochic valleys (*F. D. G. & O. S.*¹), Sinanja, Purula, Dueñas, and Calderas (*Champion*).

Allied to the last species, but differing in having a row of very small spots across the secondaries instead of a distinct band. Beneath, the marks of the secondaries are very indistinct, and the general colour is of a brownish tinge.

Our series of specimens show great uniformity.

P. drymæa is peculiar to the mountain-districts of Guatemala, ranging as high as 7000 feet at Calderas in the Volcan de Fuego.

We have figured a male from Purula, Guatemala.

31. *Phyciodes sosis*. (Tab. XXII. figg. 11, 12.)

Phyciodes sosis, Godm. & Salv. Ann. & Mag. N. H. ser. 5, ii. p. 262¹.

P. ardys quoque similis, maculis posticarum absentibus, sed alis posticis lineis undulosis tribus submarginalibus notatis, subtus maculis rufo-brunneis læte ornatis.

Hab. COSTA RICA, Irazu and Rio Sucio (*Rogers*); PANAMA, Volcan de Chiriqui, 2000 to 3000 feet (*Champion*).

A small distinct species of limited range, allied to *P. drymæa*, but with three indistinct submarginal bands of lunules on the secondaries, the innermost taking the place of the row of spots of *P. drymæa* and *P. subota*. The markings of the secondaries beneath are more distinct than in *P. drymæa*; and the general tint is of a more russet hue.

We have figured one of the types from Irazu, Costa Rica.

P. nebulosa group. Spots of the primaries ferruginous.

32. *Phyciodes nebulosa*. (Tab. XXII. fig. 13, 14.)

Phyciodes nebulosa, Godm. & Salv. P. Z. S. 1878, p. 269¹.

Alis fuscis, anticis ferrugineo maculatis; posticis ad basin ferrugineo maculatis, fascia lunulosa submarginali notatis: subtus anticis ad basin flavidis; posticis rosaceo-albidis, rufo-brunneo irroratis, macula magna irregulari mediam costam attingente rufo-brunnea.

Hab. GUATEMALA, Las Nubes (*O. S.*¹).

We only know this species from a single specimen taken by Salvin at the Hacienda of Las Nubes, on the slopes of the Cerro Zunil, in February 1874. Mr. Champion, though for some time in that locality, did not meet with it. It is a peculiar species, with no near ally in Central America. The rufous-brown spot on the secondaries beneath suggests a relationship with the *P. atronia* group.

The type is now figured.

P. fulgora group. Primaries crossed with a conspicuous tawny band.

33. *Phyciodes fulgora*. (Tab. XXII. fig. 15, 16.)

Phyciodes fulgora, Godm. & Salv. Ann. & Mag. N. H. ser. 5, ii. p. 261¹.

Alis valde elongatis, fuscis, anticis macula ad cellulæ finem, altera magna infra eam et tertia magna costam attingente aliquando secundæ conjuncta læte fulvis; posticis fasciis tribus submarginalibus notatis, intima lata, aliis angustis undulosis: subtus anticis ferrugineis, posticis ochraceis, omnibus fusco variegatis.

Hab. COSTA RICA, Irazu, Cache, and Rio Sucio (*Rogers*).

Of this fine species the only specimens we have seen are those taken by Mr. Rogers in Costa Rica, one of which we now figure.

34. *Phyciodes crithona*. (Tab. XXII. figg. 17, 18.)

Melitæa crithona, Salv. Ann. & Mag. N. H. ser. 4, vii. p. 415¹.

Phyciodes crithona, Butl. & Druce, P. Z. S. 1874, p. 348².

Alis fuscis, anticis fascia lata subapicali transversa venis divisa et macula ad angulum analem læte fulvis; posticis lineis tribus angustis submarginalibus notatis: subtus anticis rufo-fuscis fulvo maculatis, posticis rufis griseo marmoratis.

♀. Mari similis, sed major et fascia anticarum fulva latiore.

Hab. COSTA RICA (*Van Patten*²), Cache (*Rogers*); PANAMA, Volcan de Chiriqui (*Arcé*¹, *Champion*).

This species was described from specimens sent us from Chiriqui by our collector E. Arcé¹. It seems to be common in that district, as Mr. Champion has recently found it in abundance. From Costa Rica we have only three examples, showing its greater rarity in that country. It has no near allies that we are aware of, though in general appearance it is not unlike *P. fulviplaga*.

One of the types from Chiriqui is figured.

b'. Costal half of secondaries covered above with dull sericeous scales; sexes dissimilar.

35. *Phyciodes atronia*. (Tab. XXII. figg. 19, 20 ♂, 21 ♀.)

Melitæa atronia, Bates, Ent. Monthl. Mag. iii. p. 133¹.

Eresia obscurata, R. Felder, Verh. k.-k. zool.-bot. Ges. Wien, 1869, p. 471².

Alis fuscis, anticis indistincte rufo punctatis, posticis area dimidie costali sericeo-brunnea unicolori, dimidio anali lineis submarginalibus obsolete notato; subtus anticis fuscis parte apicali indistincte punctatis, posticis griseo-fuscis fusco irroratis, plaga fusca ad mediam costam.

♀. *P. ptolyce* supra haud dissimilis, fascia posticarum extus rufo marginatis; subtus mari similis, sed multo pallidioribus et maculis magis distinctis.

Hab. MEXICO, Rio Atajac (*Hedemann*²), Cordova (*Rümeli*); GUATEMALA, Dueñas (*F. D. G. & O. S.*¹, *Champion*), Zapote (*Champion*).

We have compared a typical specimen of this species with the type of *Eresia obscurata* in the Vienna Museum and found them identical. The species, however, does not seem to be common in Mexico. In Guatemala, so far as we know, it is restricted to the slopes of the Volcan de Fuego at elevations varying from 2000 to 5000 feet above the sea.

As will be seen by reference to the figures, the female we refer to this species is a very different-looking insect. We have little doubt they are correctly associated, the clue to their relationship having been supplied us by paired specimens of *P. sopolis* taken by Mr. Champion.

Our figures are taken from Mr. Champion's specimens from Zapote, Guatemala, which are in better condition than the types, but differ in no other way.

36. *Phyciodes cassiopea*. (Tab. XXII. figg. 22, 23.)

Phyciodes cassiopea, Godm. & Salv. Ann. & Mag. N. H. ser. 5, ii. p. 262¹.

Phyciodes otanes, Butl. & Druce, P. Z. S. 1874, p. 348² (nec Hewitson).

P. atroniæ quoad marem omnino similis.

♀. Feminae *P. atroniæ* quoque similis, sed supra maculis omnibus anticarum et fascia posticarum albis distinguenda.

Hab. COSTA RICA (*Van Patten*²), Cache (*Rogers*¹).

The male of this species is undistinguishable from *P. atronia*; but the female, as will be seen from the figure, differs materially.

This sex we described under the name of *P. cassiopea* before we recognized its true position. We now give a figure of the type.

As in the case of *P. atronia*, the males are much more abundant than the females.

37. *Phyciodes argentea*, sp. n.

P. atroniæ similis, sed posticis subtus argenteo-albo nec griseo-fusco lavatis.

♀. Feminae *P. atroniæ* persimilis, sed posticis sicut in mare subtus argenteo-albo suffusis.

Hab. GUATEMALA, Polochic valley (*F. D. G. & O. S.*), Choctum (*Hague*); NICARAGUA, Chontales (*Belt*).

A close ally of *P. atronia*, but differing in the underside of the secondaries of the male being of a silvery tint. This is also shown in the female.

The female was obtained by us in 1862, but has remained unrecognized till now, as we had no clue to the differences of the sexes in this group of the genus until recently.

38. *Phyciodes diallus*. (Tab. XXII. figg. 24, 25.)

Phyciodes diallus, Godm. & Salv. Ann. & Mag. N. H. ser. 5, ii. p. 260¹.

P. atroniæ quoad marem omnino similis.

♀. Feminae *P. cassiopeæ* et *P. atroniæ* similis, sed anticis fascia ultra cellulam lata alba et posticis fascia alba nulla distinguenda.

Hab. PANAMA, Volcan de Chiriqui (*Ribbe*¹), Bugaba (*Arcé*).

This species too was described by us from a female example in the collection of Dr. Staudinger; and we have since received another from Herr Ribbe, which we now figure. We have also a male, which, as in the case of *P. cassiopea*, does not differ from that sex of *P. atronia*. The three species derive their characters from the females alone, the differences in this sex being associated with a difference of locality.

Regarding *P. chromis* (Godm. & Salv. Ann. & Mag. N. H. ser. 5, ii. p. 260) we are in some doubt, as it now seems to us that it not improbably belongs to *P. diallus*, the chief difference being in the colour of the marks of the primaries. It may, however, represent a fifth species of the *P. atronia* group, having a male like the true *P. atronia*, but a female differing slightly from all the rest.

c'. Secondaries above, except outer margin and anal angle, covered with dull sericeous scales.

39. *Phyciodes fulviplaga*. (Tab. XXII. figg. 26, 27.)

Phyciodes fulviplaga, Butl. Cist. Ent. i. p. 77¹; Lep. Ex. p. 183, t. 63. f. 2²; Butl. & Druce, P. Z. S. 1874, p. 348³.

Alis fuscis, anticis macula transversa lata ultra cellulam punctisque marginem versus ochraceis, posticis margine excepto sericeo-fuscis, linea submarginali anguste fulva; subtus area medianâ plaga magna fusco-nigra ornata, posticis rufo-fuscis fusco irregulariter marmoratis.

♀. Mari similis, fascia anticarum fulva ad angulum analem producta.

Hab. COSTA RICA (*Van Patten*^{1 2}), Cache (*Rogers*).

A pretty species, with no near allies, which was first discovered by Van Patten and described by Mr. Butler. We have since received many specimens from Mr. Rogers, one of which, a female, we now figure.

40. *Phyciodes otanes*. (Tab. XXII. figg. 28, 29.)

Eresia otanes, Hew. Ex. Butt., *Eresia*, t. 6. f. 47¹.

P. fulviplagæ similis, maculis anticarum fulvis absentibus, colore sericeo posticarum in aream medianam anticarum extendente.

♀ adhuc ignota.

Hab. GUATEMALA (*O. S.*¹), Dueñas and Zapote (*Champion*).

This species was originally described by Hewitson from a specimen obtained in Guatemala by Salvin in 1859, and figured in the 'Exotic Butterflies.'¹ Since then Mr. Champion has obtained several additional specimens at Dueñas and Zapote, the type having most probably been taken at the former place.

We have not yet seen a female of *P. otanes*, which probably resembles that sex of *P. sopolis*. Our figure represents a male from Dueñas.

41. **Phyciodes sopolis.** (Tab. XXII. figg. 30 ♂, 31, 32 ♀.)

Phyciodes sopolis, Godm. & Salv. Ann. & Mag. N. H. ser. 5, ii. p. 262¹.

P. otani similis, sed anticis fulvo maculatis.

♀. Mari dissimilis. *P. ptolyce* aliquantum similis quoad maculas anticarum; posticis supra rufo perfusis.

Hab. GUATEMALA, Choctum (*Hague*¹), Sinanja, Purula (*Champion*).

A close ally of *P. otanes*, chiefly differing in having the primaries distinctly spotted. At present we have only seen specimens from the department of Vera Paz, in Guatemala, *P. otanes* being restricted to the mountains sloping towards the Pacific Ocean.

Both sexes, as determined by Mr. Champion from a pair captured at Purula, are represented on the Plate.

Note.—The following species have been placed in the genus *Phyciodes* by Mr. Kirby and others, and are said to come from Mexico or Central America. We have not been able to identify them satisfactorily.

Phyciodes mylitta, W. H. Edw.; Kirby, Cat. Diurn. Lep. p. 173.

Melitæa collina, Behr, Pr. Cal. Ac. 1863, p. 86.

A species bearing the latter name is said to come from Mexico. We have not yet met with it.

Eresia sydra, Reak. Pr. Ac. Phil. 1866, p. 335.

Near Vera Cruz, Mexico (*W. H. Edwards*).

This name most probably applies to *P. atronia*, Bates (*antea*, p. 206)=*P. obscurata* (R. Feld.); but we cannot speak positively on this point.

Phyciodes clio (Linn.), Kirby, Cat. Diurn. Lep. p. 177.

This name is based upon a figure of Merian's (t. 35), and represents a Surinam insect, more like an *Ithomia* than a *Phyciodes*. Mr. Kirby gives its locality as "Honduras," but on what authority we know not.

Phyciodes polina (Hew.), Kirby, Cat. Diurn. Lep. p. 177.

This is *Eresia polina*, and comes from Ecuador, and not Honduras, as stated by Mr. Kirby.

Phyciodes thymetus, Distant, Trans. Ent. Soc. 1876, p. xiii, ex Fabricius, Mant. Ins. ii. p. 30.

The insect called by Mr. Distant by this name is the same as *P. aineta* (Hew.). But as Fabricius's description is too vague to admit of certain recognition, and no habitat is given, it had therefore better be passed over.

BIOL. CENTR.-AMER., Rhopal., Vol. I., December 1882.

MICROTIA.

Microtia, Bates, Ent. Monthl. Mag. i. p. 83 (1864).

This genus was proposed by Mr. Bates to receive the single species described below, allied to *Melitæa*, from which it differs in several important particulars.

The genital armature of the male, however, is very like that of *Melitæa cinxia*, the tegumen being destitute of prolonged hook, and the harpagones rounded and armed with two curved points at the distal end.

The antennæ are densely scaled, more so than in the allied genera; they are composed of 32 joints, of which the terminal 13 form an abrupt club. The front legs of the male have but few long hairs; the coxa is stout = $\frac{1}{2}$ femur + trochanter; tarsus very short; tarsus + tibia = femur + trochanter. The claws of the other legs are much curved, and the tibiæ are sparingly spined beneath.

The first subcostal branch of the primaries is thrown off before, the second after the end of the cell; there is no upper discocellular; but the upper radial starts from beneath the subcostal beyond the cell. The terminal joint of the palpi is rather long and moderately swollen, the middle joint being but slightly dilated.

1. *Microtia elva*. (Tab. XX. fig. 23.)

Microtia elva, Bates, Ent. Monthl. Mag. i. p. 83¹; Butl. & Druce, P. Z. S. 1874, p. 348².

Alis rotundatis, nigro-fuscis, anticis fascia transversa subapicali, macula subtriangulari in margine externo et fascia posticarum discali fulvis; subtus omnino ac supra similibus, sed maculis et fasciis fulvis paulo dilutioribus.

♀. Mari similis, at major et fasciis fulvis latioribus distinguenda.

Hab. MEXICO, Presidio and Ventanas (*Forrer*), Oaxaca (*Deppe*), Valladolid in Yucatan (*Gaumer*); GUATEMALA, Yzabal, Motagua valley, and San Gerónimo (*F. D. G. & O. S.*¹), Chisoy and Polochic valleys (*Hague*); NICARAGUA¹, Chontales (*Belt*); COSTA RICA (*Van Patten*²).—COLOMBIA.

This species was originally described by Mr. Bates from specimens obtained by us in Guatemala, and from others in his own collection from Nicaragua. We have since discovered its existence in the Berlin Museum, to which it was sent from Mexico by Deppe some fifty years ago. We now trace it to Northern Colombia, where it occurs in some profusion near Santa Marta.

There is some slight variation in specimens from different parts of its range. Those from Mexico have the tawny bands of the wings narrower than is usual in examples of more southern origin. This especially applies to individuals from Yucatan, in which these bands are very narrow.

The vertical range of *M. elva* in Guatemala extends from the sea-level at Yzabal to a height of about 3000 feet at San Gerónimo. We never met with it in the countries bordering the Pacific Ocean.

Our figure represents one of the types from Yzabal, Guatemala.

MORPHEIS.

Morpheis, Hübner, Samml. ex. Schm. iii. t. —; Westwood, Gen. Diurn. Lep. p. 255.

Anemeca, Kirby, Cat. Diurn. Lep. p. 179.

This name was first used by Hübner for a “coitus” of *Heterocera*, but afterwards applied to the present species, and adopted by Westwood for the same insect. The position of the genus is now considered to be near *Synchlœ* and its allies; and this we think correct. Westwood, however, placed it in quite another association, *Pyrrhogyra*, *Eteona*, and *Epicalia* being its nearest neighbours in the ‘Genera of Diurnal Lepidoptera.’

The genital armature of the male is very like that of *Melitæa*, the tegumen being atrophied and the harpagones developing curved horn-like spines. The antennæ have 37 joints, the terminal 15 constituting a moderate-sized club. The terminal joint of the palpi is long and stout, the middle joint short, and but slightly swollen. The front legs of the male are densely hairy, all the joints being short and stout; femur + trochanter = $\frac{3}{2}$ coxa; tibia = $\frac{4}{5}$ femur; tarsus = $\frac{1}{2}$ tibia. Claws of the other legs curved; tibiæ not spiny on the outer surface. The first subcostal branch of the primaries thrown off before, and the second after the end of the cell.

The single species of this genus is peculiar to Southern Mexico.

1. *Morpheis ehrenbergi*.

Morpheis ehrenbergi, Hübn. Samml. ex. Schm. iii. t. —¹; Doubl. & Hew. Gen. Diurn. Lep. p. 255, t. 43. f. 1².

Alis nigris, anticis maculis quatuor subapicalibus elongatis et posticis nonnunquam lineis leviter indicatis citrinis; subtus ut supra, sed lineis citrinis multo longioribus in anticis ad marginem ductis, in posticis a basi ad marginem externum radiantibus, alis omnibus ad basin et pedibus rubris.

Hab. MEXICO (*Deppe*), Mazatlan (*Forrer*), Tacubaya (*Hedemann*), Oaxaca (*Fenochio*).

This somewhat peculiar species is well figured by Hübner¹, both sexes being represented. It is peculiar to Southern Mexico, where, however, it is not uncommon, specimens being included in most collections made in that country. In its sombre coloration and in its size and the shape of the wings, *M. ehrenbergi* resembles the Erycinid *Hades noctula*; but it is questionable if that species is found in the same districts.

EUREMA.

Eurema, Doubleday, Gen. Diurn. Lep. i. p. 192 (1848).

Hypanartia, Hübner, Samml. ex. Schm.

This genus comprises seven American species, one from West Africa, and one from South Africa, Bourbon, and Mauritius, all of them being, so far as we can see, congeneric. The American species are almost strictly Neotropical, a single species only (*E. lethe*) crossing the Mexican frontier into Texas. In Central America five species occur, only one of which (*E. arcæi*) is peculiar to our region. *E. lethe* and

E. dione have a very wide range over the southern continent; and *E. godmani* and *E. kefersteini* are found in Colombia and Venezuela.

The genital armature of the male is rather peculiar in being much compressed; the tegumen is strongly developed, and the central spine is long and stout: the harpagones are feeble; those of *E. lethe* are two-lobed, each lobe bearing a blunt spur; those of *E. kefersteini* have a single lobe without spur, but terminated with hairs.

The palpi are slightly hairy, the terminal joint being rather stout and about one third the middle joint, which is slender and but slightly swollen. The antennæ have 37 joints, whereof the terminal 10 form a moderate club, the last joint being blunt. The front legs of the male are hairy and slightly scaled; coxa $> \frac{1}{2}$ femur + trochanter; tibia = femur; tarsus (suture of a joint just visible) = $\frac{2}{3}$ tibia. Claws of the other legs much curved, paronychia nearly straight, pulvillus very large. The costa of the primaries is in a simple curve; the first and second subcostal branches are thrown off before the end of the cell, the third some distance beyond it; the upper discocellular is very short, and the middle about half the lower, which is well developed. The precostal nervure of the secondaries is nearly straight, and stands about at right angles to the costal.

- a. Primary wings without hyaline spots; outer margin of secondaries produced so as to form a slight tail.

1. *Eurema lethe*.

Papilio lethe, Fabr. Ent. Syst. iii. p. 80¹.

Eurema lethe, Strecker, Butt. N. Am. p. 127².

Hypanartia lethe, Butl. & Druce, P. Z. S. 1874, p. 346³.

Alis fulvis, anticarum apicibus et fascia transversa per cellulam ad angulum analem extendente nigris, area apicali nigra maculis fulvis serie duplici ornatis; posticis maculis submarginalibus, plaga elongata apicali et lunulis submarginalibus ad angulum analem nigris: subtus fulvo-flavis brunneo marmoratis, posticis pro majore parte brunneo irroratis ad angulum analem, griseo atomatis.

Hab. NORTH AMERICA, Texas².—MEXICO, Cordova (*Rümeli*), Jalapa (*Höge*), Oaxaca (*Deppe*, *Fenochio*); GUATEMALA, Chuacus, San Gerónimo, Polochic valley (*F. D. G. & O. S.*), Purula, Cerro Zunil (*Champion*); COSTA RICA (*Van Patten*³), Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Arcé*, *Champion*).—SOUTH AMERICA from Colombia to South Brazil and Paraguay.

A common and widely ranging butterfly, which is found throughout our region, and just passes the northern frontier into Texas². In Guatemala it has a mountain range as high as about 4000 feet at Purula, but the low-lying lands are its home.

This species is very constant in its markings. Notwithstanding its range, we are unable to trace any noteworthy difference between Mexican and Paraguayan specimens.

2. *Eurema godmani*.

Eurema godmani, Bates, Ent. Monthl. Mag. i. p. 85¹.

Hypanartia godmani, Butl. & Druce, P. Z. S. 1874, p. 346².

Eurema atropos, Feld. Reise d. Nov. Lep. p. 397, t. 51. ff. 5, 6³.

E. lethe similis, sed anticarum apicibus nigris, fascia maculosa alba ad apicem notata, distinguenda; subtus quoque alis multo obscurioribus et lineis brunneis latioribus diversa.

Hab. MEXICO (*Sallé*³), Potrero (*Hedemann*), Cordova (*Rümel*), Yucatan (*Bilimek*); GUATEMALA, Yzabal and central valleys (*F. D. G. & O. S.*¹), Polochic valley (*Hague*), San Gerónimo, Cerro Zunil (*Champion*); COSTA RICA (*Van Patten*²); PANAMA, Volcan de Chiriqui (*Arcé, Champion*).—COLOMBIA³; VENEZUELA.

This is a close ally of *E. lethe*, and, though much more restricted in its range, it is found in some of the same districts as that species. It does not pass the northern frontier of Mexico, and in South America it is confined to the north-western parts, viz. Colombia and Venezuela.

E. godmani was first described by Mr. Bates from specimens obtained by us in Guatemala¹. It soon afterwards received another name from Dr. Felder, who described and figured Mexican and Colombian examples as *E. atropos*³. The species, as already said, is allied to *E. lethe*, but may at once be distinguished by the apical half of the primaries being wholly black, with the exception of a transverse apical row of white spots.

3. *Eurema kefersteini*.

Eurema kefersteini, Doubl. & Hew. Gen. Diurn. Lep. i. p. 194, t. 24. f. 4¹.

Hypanartia kefersteini, Butl. & Druce, P. Z. S. 1874, p. 346².

Alis rufis, anticis dimidio apicali nigro punctis albis notato, posticis serie duplici macularum vel linearum submarginali nigra notatis; subtus alis rufis brunneo irroratis, et anticis maculis minutis albescentibus pictis præcipue ad marginem externum.

Hab. GUATEMALA, Polochic valley (*F. D. G. & O. S.*), Purula (*Champion*); COSTA RICA (*Van Patten*)², Rio Sucio (*Rogers*); PANAMA, Volcan de Chiriqui (*Champion*).—COLOMBIA; VENEZUELA¹; ECUADOR; PERU; BOLIVIA¹.

Originally named, and figured in the 'Genera of Diurnal Lepidoptera,' by Doubleday and Hewitson from South-American specimens¹. We have also received it from Guatemala and Costa Rica. The whitish spots on the primaries of our Central-American examples are rather larger than in examples from South America; but the difference is not great. In the neighbourhood of Bogota there is a closely allied form having the spots of the primaries transparent instead of white, which has been separated by Dr. Felder and described under the name of *E. lindigii*.

- b. Primary wings with a small hyaline spot between the first and second median branches; secondaries elongated so as to form a conspicuous tail.

4. *Eurema dione*.

Vanessa dione, Latr. in Humb. & Bonpl. Obs. Zool. ii. p. 87, t. 37. ff. 1, 2¹.

Alis fuscis, anticis nigro transfasciatis, macula hyalina inter ramos medianos primum et secundum, et aliis minutis ad angulum apicalem; posticis lineis nigris margini externo plus minusve parallelis notatis; subtus alis ferrugineo-rufis fusco irroratis, anticis lineis irregularibus brunneis transfasciatis, posticis quoque similiter notatis et ocellis indistinctis cæruleo pupillatis ornatis.

Hab. GUATEMALA, Polochic valley (*Hague*), Purula (*Champion*).—COLOMBIA; ECUADOR; PERU; BOLIVIA.

This insect has but little external resemblance to the two preceding species of the genus. At first sight it approaches more nearly in its general form and markings to some of the members of the genus *Timetes*. This was remarked by Latreille, who compares it with Cramer's figure of *T. chiron*, and points out its similarity to that insect. From *Timetes*, however, it may readily be distinguished by the presence of a small hyaline spot between the first and second median branches of the primaries.

Its range is somewhat singular, as it inhabits Guatemala, where, however, it is not very abundant. Thence southwards to Panama it does not occur; but in this district its place appears to be taken by its close ally *E. arcæi*. It reappears in Colombia, south of the isthmus, whence it extends as far as Bolivia.

5. *Eurema arcæi*. (Tab. XXIII. figg. 1, 2.)

Eurema arcæi, Salv. Ann. & Mag. N. H. ser. 4, vii. p. 415¹.

Hypanartia arcæi, Butl. & Druce, P. Z. S. 1874, p. 346².

E. dionæ similis, sed alis obscurioribus et anticis fascia subtriangulari fulva plus minusve margini externo parallela distinguenda.

Hab. COSTA RICA (*Van Patten*²), Rio Sucio (*Rogers*); PANAMA, Chiriqui (*Arcé*¹, *Zahn*).

As mentioned under the preceding species, this is a close ally of *E. dione*. It differs from it in the wings being of a much richer and darker brown colour, and in having a broad subtriangular fulvous band towards the outer margin of the primaries. It occurs in Costa Rica, and extends southwards to the Isthmus of Panama, appearing to replace *E. dione* in these districts.

This species was originally described by us from a specimen sent by our collector Arcé (after whom we named it) from Chiriqui.

VANESSA.

Vanessa, Fabricius, Mag. f. Insectenk. vi. p. 281 (1807); Doubleday, Gen. Diurn. Lep. i. p. 198.

Vanessa is strictly a genus of the northern hemisphere, and only enters our fauna as an inhabitant of the subalpine regions of Mexico and Guatemala. Here we find the well-

known and widely ranging species *V. antiopa*, and in the former country *V. cyanomelas*, of which little can be said at present.

In *V. urticae* the tegumen is very feeble, but the harpagones well developed, completely enclosing it; parallel to the ventral edge of these latter is a long straight spine; and the outer margin is drawn into several well-defined spinous lobes. The palpi are slightly hairy, the terminal joint being slightly swollen, and about one third the middle joint, which is not at all distended. The antennæ have 39 joints, whereof 11 form a moderate club, the last joint being acute. The front legs of the male are hairy and closely scaled, the tibia and tarsus having long isolated hairs. Coxa = $\frac{2}{3}$ femur + trochanter; tibia = $\frac{3}{4}$ femur + trochanter; tarsus (two-jointed) = tibia; the claws of the other legs are curved, the paronychial straighter, and the pulvillus moderately developed.

The costa of the primaries is simply curved; the first and second subcostal branches are thrown off before the end of the cell; the upper discocellular is very short, the middle abruptly curved, and the lower feeble and almost atrophied; the precostal nervure of the secondaries is nearly straight, and stands nearly at right angles to the costal.

1. *Vanessa antiopa*.

Papilio antiopa, Linn. Syst. Nat. i. p. 776¹.

Vanessa antiopa, Staud. Cat. Lep. Eur. p. 16²; Strecker, Cat. N. Am. Butt. p. 133³.

Alis sanguineo-brunneis marginibus late flavis, punctis cyaneis serie submarginali positis; subtus nigricantibus nigro crebre irroratis, marginibus flavidis nigro quoque irroratis.

Hab. NORTH AMERICA¹ generally, except polar regions³.—MEXICO, Orizaba (*Sallé*), Oaxaca (*Fenochio*); GUATEMALA, tablelands near Antigua and Dueñas (*F. D. G. & O. S.*).—EUROPE²; NORTHERN ASIA² and JAPAN.

This well-known insect has a very extensive range, being found in the highlands of Mexico and Guatemala, and throughout temperate America, Asia, and Europe. In Guatemala it is a very scarce species, and is confined to the mountain-regions. We obtained but two specimens: the first was captured by ourselves near Antigua, where it had settled at the sides of a wet place in the road in company with some *Cyclogrammata* and *Eubages*. The outer margins of all our Central-American examples are of the ordinary yellow colour.

2. *Vanessa cyanomelas*.

Vanessa cyanomelas, Doubl. & Hew. Gen. Diurn. Lep. p. 201, t. 26. f. 5¹.

Alis obscure viridescentibus (secundum figura Hewitsoniana) marginibus externis pallidioribus et nigro irroratis.

Hab. MEXICO¹.

This insect bore a manuscript name of Boisduval, which was adopted by Doubleday and

Hewitson, who gave a figure of it in their 'Genera of Diurnal Lepidoptera.' We have never seen this specimen, nor any thing like it from Central America; but Monsieur C. Oberthür, into whose hands Dr. Boisduval's collection passed, tells us that the type still exists, and that the figure is a good representation of the insect, which he considers to belong to an excellent species. It is evidently closely allied to *V. antiopa*, and is said to inhabit Mexico.

GRAPTA.

Grapta, Kirby, Fauna Bor.-Am. iv. p. 292 (1837); Doubleday, Gen. Diurn. Lep. i. p. 195.

This is another northern genus, found in both the Old and New Worlds, and entering our region only in Mexico, where two species have been discovered.

The secondary male sexual organs in *Grapta* have the tegumen very feeble, but with lateral projections, one on each side, meeting in the middle line below the central spine the harpagones have the dorsal edge prolonged into a stout incurving spine.

The palpi are hairy, and clothed anteriorly with densely matted scales; the terminal joint is about one third the middle joint, which is slightly swollen; the antennæ have 37 joints, whereof 11 form a moderate club, the last joint of which is blunt; the front legs of the male are slightly hairy, but clothed with densely matted scales; coxa= $\frac{1}{2}$ femur+trochanter; tibia=femur; tarsus= $\frac{1}{2}$ tibia; the claws of the other legs are strongly curved, the paronychial being also curved and the pulvillus well developed. The margins of the wings are very undulating, the costa of the primaries sinuated towards the base; the first and second subcostal branches are thrown off before the end of the cell, the third a short way beyond it; the upper discocellular is short and only half the middle. The costal nervure of the secondaries is much curved, the precostal being nearly at right angles to it.

Grapta may be distinguished from *Vanessa* not only by the curvature of the costa and the crenulated margin in both wings, but by the palpi and front legs being clothed with large densely matted scales.

1. *Grapta g-argenteum*.

Grapta g-argenteum, Doubl. & Hew. Gen. Diurn. Lep. p. 197, t. 26. f. 3¹.

Alis fulvis ad basin magis obscuris, area mediana maculis nigris notatis, anticis fusco marginatis, posticis serie duplici macularum nigrarum submarginali notatis; subtus alis sordide fulvis nigro præcipue ad basin irroratis, et litera g vel c argentea ad cellulæ finem notatis.

Hab. MEXICO¹, Oaxaca (*Fenochio*), Rio del Monte (*coll. Staudinger*).

We have a single example of this species, obtained by Fenochio in the mountains of Oaxaca, and have seen others in the collection of Dr. Staudinger from Rio del Monte. The former agrees accurately with Doubleday and Hewitson's figure in the 'Genera of Diurnal Lepidoptera.' In its size and in the arrangement of the black spots of the

wings *G. g-argenteum* resembles *G. interrogationis* of Fabricius, a common insect in North America. It differs from this, however, in having more dentated margins, and in the nearly uniform bright tawny colour of its upper surface. Beneath it is paler and more irrorated. It does not appear to be a very common insect, and is doubtless confined to the highlands.

2. *Grapta haroldi*.

Grapta haroldii, Dewitz, Mitth. Münch. ent. Ver. 1877, p. 89, t. 2. f. 6¹.

Alis fulvis (secundum figuram) nigro marginatis, anticis costa et basin versus rubro-fuscis, maculis nigris notatis.

Hab. MEXICO (*Ehrenberg*¹).

The only two examples we know of this insect were obtained by Ehrenberg in Mexico, and are now in the Museum at Berlin, where we saw them in 1876. The species has since been described and figured by Herr Dewitz. It differs considerably from any other member of the genus with which we are acquainted, as will be seen by reference to Herr Dewitz's figure.

PYRAMEIS.

Pyrameis, Hübner, Verz. bek. Schm. p. 33 (1816); Doubleday, Gen. Diurn. Lep. i. p. 202.

Members of this genus are distributed all over the world, *P. cardui* having probably the widest range of any butterfly.

In *Pyrameis* the tegumen has two long lateral spines besides the central one; the harpagones are large, projecting beyond the tegumen and inclosing it; they bear three spines on the inner surface, placed rather widely apart. The antennæ have 41 joints, 12 forming a rather abrupt club, the last joint being acute; the palpi are slightly hairy, the terminal joint < half the middle joint, which is slightly swollen. The front legs of the male are hairy and slightly scaled; coxa = $\frac{1}{2}$ femur + trochanter; tibia = femur; tarsus (two-jointed) = tibia. The costa of the primaries is simply curved; the first and second subcostal branches are thrown off before the end of the cell, the third a long way beyond it; the upper discocellular is absent, and the lower atrophied; the precostal nervure of the secondaries is nearly straight, and stands nearly at right angles to the costal.

1. *Pyrameis cardui*.

Papilio cardui, Linn. Syst. Nat. i. p. 774¹.

Vanessa cardui, Staud. Cat. Lep. Eur. p. 17².

Pyrameis cardui, Butl. & Druce, P. Z. S. 1874, p. 346³; Strecker, Cat. Butt. N. Am. p. 136⁴.

Alis nitide fulvis nigro notatis præcipuo ad apicem anticarum, macula ultra cellulam tripartita aliisque quatuor subapicalibus albis, posticis ocellis submarginalibus quatuor (interdum quinque) cæcis; subtus alis dilutionibus, anticis dimidio proximo rosaceo lavatis, posticis ochraceo-fuscis albo marmoratis, ocellis pupillatis totidem ut in pagina superiore.

Hab. NORTH AMERICA, except polar regions⁴.—BRITISH HONDURAS, Corosal (*Roe*); BIOL. CENTR.-AMER., Rhopal., December 1882.

GUATEMALA, Polochic valley (*Hague*); COSTA RICA (*Van Patten*³).—EUROPE, Azores and Canary Islands; ASIA and Japan; AFRICA and Madagascar.

We have examples of the true *P. cardui* from Corosal, almost at the sea-level, in British Honduras, from the hot valley of the Polochic in Guatemala, and also from Costa Rica. It is one of the commonest butterflies throughout North America and Europe, and is also found in Asia and Africa. From all this area we have specimens which show scarcely any variation in their markings.

2. *Pyrameis kershawi*.

Cynthia kershawii, M'Coy, Ann. & Mag. N. H. ser. 4, i. p. 76¹.

P. cardui similimus, sed posticis ocellis tribus angulum analem propioribus cæruleo-pupillatis.

Hab. COSTA RICA, Irazu (*Rogers*).—AUSTRALIA¹.

Mr. F. M'Coy separated the Australian form of *P. cardui* under the above name in consequence of all the specimens from that country having the pupils of the last three submarginal spots and two small spots at the anal angle of the posterior wings bright blue. In all other respects they agree with *P. cardui*. We have two examples, sent us by Mr. Rogers from Irazu in Costa Rica, which have precisely these markings, and are consequently undistinguishable from the Australian insect. Hence, if *P. kershawi* is to be admitted as a distinct species, it must be included in the Central-American fauna, though its occurrence at two such widely separated places seems to cast some doubt on the value of such slight specific characters; and this is of more weight, as in two or three specimens of *P. cardui* from North America we find slight but decided indications of these blue markings.

3. *Pyrameis huntera*.

Papilio huntera, Fabr. Syst. Ent. p. 499¹.

Pyrameis huntera, Strecker, Butt. N. Am. p. 138²; Dist. Proc. Ent. Soc. 1876, p. xiii³.

Pyrameis carye, Butl. & Druce, P. Z. S. 1874, p. 346⁴ (nec Hübner).

P. cardui similis, sed anticis macula ultra cellulam fulva nec alba plerumque distinguenda; ocellis duabus posticarum paginæ inferioris magnis quoque differt.

Hab. NORTH AMERICA, from Canada southwards².—MEXICO, Oaxaca (*Fenochio*); GUATEMALA, Dueñas, Los Altos and central valleys (*F. D. G. & O. S.*), San Gerónimo (*Champion*), Polochic valley (*Hague*); COSTA RICA (*Van Patten*⁴), Talamanca (*Gabb*)³ Volcan de Irazu and San Francisco (*Rogers*); PANAMA, Chiriqui (*Arcé, Champion*).—ANTILLES, Haiti and Jamaica; SOUTH AMERICA, Andes from Colombia to Bolivia; Argentine Republic; CANARY ISLANDS.

This species may readily be distinguished from *P. cardui* by its brighter colour on the underside, and in having two large ocelli on the posterior wings in place of the row of submarginal spots. It is an exceedingly common insect throughout the whole of America from Canada to the Argentine Republic.

It is a singular fact also that *P. huntera*, and not *P. cardui*, is the common "Painted Lady" of the Canary Islands.

4. *Pyrameis carye*.

Hamadryas decora carye, Hübn. Samml. ex. Schm. i. t. 45¹.

Vanessa charie, Blanch. in Gay's Faun. Chil. vii. p. 26; Atl. Lep. t. 2. f. 5².

Pyrameis carye, Strecker, Butt. N. Am. p. 138³.

P. cardui similis, sed macula anticarum ultra cellulam semper fulva nec alba; subtus posticis obscurioribus et ocellis paginæ superioris vix indicatis.

Hab. NORTH AMERICA, California, Nevada, Arizona³.—MEXICO, Jalapa (*Höge*), Oaxaca (*Fenochio*); GUATEMALA, Dueñas and Los Altos (*F. D. G. & O. S.*).—ECUADOR; PERU; CHILI²; ARGENTINE REPUBLIC.

Closely allied to *P. cardui*, but differs in being of a much brighter colour on the upperside, in having the transverse spot beyond the cell on the costa tawny instead of white. The apical submarginal spot on the secondaries is obsolete; the remaining four have blue pupils; and the underside is likewise of a duller colour.

Our examples of this species show that its range extends from California to the Argentine Republic.

5. *Pyrameis atalanta*.

Papilio atalanta, Linn. Syst. Nat. i. p. 779¹.

Vanessa atalanta, Staud. Cat. Lep. Eur. p. 17².

Pyrameis atalanta, Strecker, Butt. N. Am. p. 135³.

Alis nigris, anticis macula ultra cellulam venis divisa et quinque aliis ad apicis marginem albis, fascia transversa a costa ad angulum analem coccineo-rufa, posticarum margine externo eodem colore maculas albas includente; subtus alis fuscis, anticis inter maculas paginæ superioris cæruleo notatis; posticis nigro marmoratis, margine externo cinerascete.

Hab. NORTH AMERICA, except polar regions³.—MEXICO, Orizaba (*Sallé*), Cordova (*Rümeli*); GUATEMALA, Dueñas, Los Altos (*F. D. G. & O. S.*).—HAITI; EUROPE generally, except polar regions²; AZORES.

Found in the highlands of Mexico and Guatemala, but not very abundant. Specimens from these countries do not differ from those from Europe. It has a close ally in India in *P. callirhoe*, and is also represented in Java, Australia, New Zealand, and the Sandwich Islands by kindred species

JUNONIA.

Junonia, Hübner, Verz. bek. Schm. p. 34 (1816); Doubleday, Gen. Diurn. Lep. p. 206.

The American representatives of this genus are limited to two closely allied species which are spread over the greater part of South America, Central America, and the

southernmost of the United States. In the Old World about a score of species have been described; and these are spread over the whole of the tropical portion of the eastern hemisphere, one species (*J. vellida*) being found in Australia and many of the islands of the Pacific Ocean.

J. cænia seems to belong to the same Old-world group as this species.

In *J. cænia* the subcostal nervure of the primaries gives off two branches before the end of the cell, and the absence of a lower discocellular nervule renders the cell quite open. The front legs of the male are slightly hairy; the coxa $> \frac{1}{2}$ femur + trochanter; tibia + tarsus (single-jointed) about = femur; of the middle and posterior legs the femur is bare, the tibia and tarsi being strongly spined beneath, and the claws moderately curved. The palpi are moderately hairy, the terminal joint rather slender, the middle joint being stout and moderately swollen. The antennæ have 37 joints, whereof the terminal 10 form an abrupt club. The secondary sexual organs of the male have a tegumen with a long slightly decurved median hook; the harpagones are long, narrow, and rounded at the end, with a strong slightly recurved tooth on the inner edge near the end.

1. *Junonia cænia*.

Junonia cænia, Hübn. Samml. ex. Schm. ii. t. 32¹; Strecker, Butt. N. Am. p. 138².

Junonia pallens, Feld. Reise d. Nov. Lep. p. 401³; Butl. & Druce, P. Z. S. 1874, p. 346⁴.

Junonia gouveira, Dist. Proc. Ent. Soc. 1876, p. xiii⁵.

Alis fuscis bioculatis, anticis maculis duabus in cellula ferrugineis, tertia magna ultra eandem irregulari a costa ad marginem externum extendente, posticis lineis submarginalibus tribus nigris ornatis; subtus valde variabilibus, plerumque fusco-ferrugineis et ocellis paginæ superioris plus minusve indicatis, his interdum fere obsoletis.

Hab. NORTH AMERICA, southern portion².—MEXICO (*Deppe*), Orizaba (*Hedemann*), Cordova (*Rümeli*), Oaxaca (*Fenochio*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Motagua and Polochic valleys (*F. D. G. & O. S.*), Chuacus (*Hague*), San Gerónimo, Cahabon (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*⁴, *Gabb*⁵); PANAMA, Chiriqui, Calobre (*Arcé*), Caldera (*Champion*); Lion Hill (*M. Leannan*), Colon (*Markham*).—ANTILLES, Cuba, Jamaica, Haiti; COLOMBIA.

Considerable variation occurs in this species, both on the upper and under sides. The ocelli in North-American specimens are very large, and the insect is generally of a lighter colour than those from further south. Hübner's figure of *J. cænia* represents one of these northern forms; but we have Mexican examples which are not to be separated from them, though in passing southwards towards Colombia the ocelli become much smaller, and the insect has generally a darker colour; but these differences are not quite constant in the same locality. In South America there is a closely allied species, the male of which has the internal area of the secondaries more or less tinged with dark green.

The variations of this species have caused it to be described many times; but with our long unbroken series of specimens before us we do not think it possible to separate more than two species. Our Costa-Rican specimens are of the usual type found in Central America; and we do not separate them under the names selected for them by Messrs. Butler and Druce ⁴ and Mr. Distant ⁵.

ANARTIA.

Anartia, Hübner, Verz. bek. Schm. p. 33 (1816); Doubl. Gen. Diurn. Lep. p. 214.

The peculiar arrangements of the subcostal branches of the primaries in the members of this genus render it of easy definition. Doubleday first drew attention to these characters, and described them with his usual care; but on one or two small points we find he is not quite correct, as we will shortly show.

In *Anartia iatrophæ* the first subcostal branch traverses the costal nervure; the second anastomoses with it, but does not pass out to the costa as a separate nervule.

In *A. fatima* the first subcostal branch seems to be entirely absent; the second cuts the costal nervure and passes beyond it.

In *A. lytræa* and *A. chrysopelia* the second subcostal branch starts as a branch of the first, and does not originate from the subcostal nervure. Doubleday says that the first branch is wanting; but this, so far as we can see, is not the case.

Thus the members of the genus group themselves into three categories as regards their neurulation, and not two as arranged in the 'Genera of Diurnal Lepidoptera.'

The front legs of the male of *A. iatrophæ* are slightly hairy; the coxa > femur + trochanter; tibia=femur; tarsus (single-jointed) < $\frac{1}{2}$ tibia. The middle and posterior legs are spinous, and the claws moderately curved. The palpi are slender, moderately hairy, the terminal joint rather attenuated, and the middle joint but slightly swollen. The antennæ have 33 joints, the terminal 9 forming a slender club. The secondary male organs have a tegumen with the central spine bifid for the greater part of its length; the harpagones are simple, without spines or projections, and they do not protrude beyond the point of the tegumen.

Anartia comprises five species, most of which are very common insects, being inhabitants of the more open country. Two species are found in our region—one, *A. fatima*, being peculiar to it, but represented in South America by *A. amalthæa*; the other, *A. iatrophæ*, is common everywhere throughout the Neotropical Region. Two other species are peculiar to the Antilles—*A. chrysopelia* belonging to Cuba, and *A. lytræa* to Haiti and Jamaica.

1. *Anartia iatrophæ*.

Papilio iatrophæ, Linn. Syst. Nat. i. p. 779¹.

Anartia iatrophæ, Butl. & Druce, P. Z. S. 1874, p. 346²; Strecker, Butt. N. Am. p. 139³.

Alis fusco-canescens lineis undulatis fuscis notatis, anticis oculo uno, posticis duobus nigris ornatis; subtus alis dilutioribus, lineis fuscis paginae superioris plerumque coccineo lavatis.

Hab. NORTH AMERICA, Florida, Texas ³.—MEXICO, Presidio (*Forrer*), Cordova (*Rümeli*), Oaxaca (*Deppe*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Yzabal, San Gerónimo, Polochic valley, Retalhuleu (*F. D. G. & O. S.*), Teleman (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten* ²): PANAMA, Chiriqui (*Champion*), Calobre (*Arcé*); PANAMA, Lion Hill (*McLeannan*), Colon (*A. H. Markham*).—ANTILLES; SOUTH AMERICA to South Brazil.

A very common insect throughout Tropical America. Individuals are subject to some variation, certain specimens being much darker in colour than others, while some have the wavy lines on the underside of the secondaries bright red instead of brown.

This species is a very distinct one, having no very close allies. It is found in all the warmer parts of Guatemala up to an elevation of about 3000 feet, and flies in the more open country rather than the forests.

2. *Anartia fatima*.

Papilio fatima, Fabr. Ent. Syst. iii. p. 81 ¹.

Anartia fatima, Hübn. Zutr. ex. Schm. fünftes Hund. p. 8, ff. 813, 814 ²; Butl. & Druce, P. Z. S. 1874, p. 346 ³.

Alis subcaudatis fuscis fascia communi albida, anticis maculis exterioribus coloris ejusdem, posticis fascia abbreviata interrupta ultra cellulam coccinea: subtus pallidioribus, anticarum cellula lineis nigris transfasciata et posticis linea nigra per cellulam transeunte.

Hab. MEXICO ², Presidio (*Forrer*), Cordova (*Rümeli*), Oaxaca (*Deppe*, *Fenochio*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Polochic and Motagua valleys, Retalhuleu (*F. D. G. & O. S.*), Choctum (*Hague*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten* ³), San Francisco (*Rogers*); PANAMA, Chiriqui (*Champion*), Calobre (*Arcé*), Lion Hill (*McLeannan*), Colon (*A. H. Markham*).

Like the last, this is a very common species, ranging from Mexico to Panama, where its place is taken by an allied form (*A. amalthea*), which continues southwards as far as Southern Brazil. In Guatemala it is found from the sea-level to an elevation of about 3000 feet, frequenting the more open spots and clearings.

EUNICA.

Eunica, Hübn., Verz. bek. Schm. p. 61 (1816).

Myscelia (partim), Doubleday, Gen. Diurn. Lep. p. 220.

This genus, as now restricted, contains about sixty species, the valley of the Amazons and the eastern spurs of the Andes being the abode of the greater number. In Central America, however, it is well represented by fourteen species, four of which occur in Mexico, only one passing across our northern frontier into the United States. The rest of our species are found in Costa Rica and the State of Panama.

The position of certain pencils of hairs on the wings, or their absence altogether, affords a ready method of dividing the numerous species of the genus into sections, and gives fairly natural results in grouping allied species together. Besides those pencils of hairs mentioned in the following arrangement, others exist in more southern members of the genus; so that the same system of subdivision can be carried out in regard to the whole of the species.

The neururation of the primaries is much like that of a number of closely allied genera, such as *Myscelia*, *Epiphile*, &c.; but sexual difference in the length of the terminal joint of the palpi serves to distinguish *Eunica* from any of these.

In *Eunica* the subcostal nervure of the primaries gives off two branches before the end of the cell. In some species, such as *E. pusilla*, the median nervure is considerably swollen towards the base; and in these species the first median branch is thrown off at the distal end of the swollen part. In others, such as *E. augusta*, the median nervure is much less swollen, and the first branch thrown off much nearer the base of the nervure, the branch partaking of its slight swelling. The front legs of the male are slightly hairy; coxa > femur+trochanter; tibia slightly < femur; tarsus (single-jointed) nearly=tibia. Middle and posterior legs spinous beneath; claws short and much curved. Palpi rather stout; terminal joint in the male very short and ovate, in the female longer and more pyriform; middle joint in both sexes stout and slightly swollen. Antennæ with 43 joints, the terminal 12 forming a slight club. The secondary male organs have a tegumen with a slender point hardly depressed; the harpagones are elongated and narrow, without hooks or projections, slightly upturned at their distal ends, and hairy along the ventral surface near the end.

a. Male with a pencil of hairs near the base of the cell of the secondaries above.

a'. Apex of primaries rounded, outer margin convex.

1. ***Eunica mira*.** (Tab. XXIII. figg. 10, 11.)

Eunica mira, Godm. & Salv. P. Z. S. 1877, p. 63¹.

Alis nigro-fuscis, anticis ultra cellulam cæruleo lavatis, fascia subapicali alba et plaga cærulea ad angulum analem notatis, posticis ad angulum apicalem sordide albis, maculis duabus nigris in hac regione notatis; subtus submicanti-viridi-cæruleis nigro distincte variegatis, anticarum apicibus albis, posticis linea longitudinali fulva per medium eunte.

Hab. PANAMA, Veraguas (*Arcé*¹).

A single damaged female specimen is all we have yet received of this species, which doubtless cannot fail to be one of considerable beauty. The secondaries beneath, bearing a line of fulvous over the region of the median nervure, point to the relationship of *E. mira* with *E. sophronisba* and *E. chlororhoa*, both remarkable species in the genus. From analogy we believe the male will prove to have black wings, and the distal half of the secondaries rich blue or some other brilliant colour.

b'. Apex of primaries elongated, outer margin concave.

2. *Eunica caresa*.

Cybdelis caresa, Hew. Ex. Butt. *Cybdelis*, iii. f. 20¹.

Eunica caresa, Bates, Journ. Ent. ii. p. 197².

Alis velutino-fusco-nigris, albo extus ciliatis, anticis elongatis apice valde hamatis, area discali et alæ parte basali late purpureo-cyaneis, posticis ad basin eodem colore lavatis; subtus fuscis, anticarum apicibus et posticis omnino rosaceo tinctis et undique albido atomatis, maculis et lineis omnibus valde indistinctis, ocello unico ad anticarum apicem, et posticis quatuor ultra cellulam ornatis, his minutis, parte proxima nigra, parte distali cærulescente.

Femina brunnea, anticis ad apicem obscurioribus fascia lata alba transvittatis, maculis tribus subapicalibus quoque notatis; subtus sicut in mare, maculis paulo clarioribus.

Hab. GUATEMALA, Zapote (*Champion*).—COLOMBIA¹; ECUADOR; PERU; BOLIVIA; AMAZONS².

Colombia is the country whence Hewitson's types were procured; but the range of the species has since been traced as far south as Bolivia and to the valley of the Upper Amazons. We have also recently received from Mr. Champion several examples from the mountains of Guatemala sloping towards the Pacific Ocean; these were taken at an elevation of about 2000 feet above the sea. It is remarkable, however, that no other trace of it has as yet been found in Central America. Our Guatemala specimens have the markings of the secondaries rather more uniform beneath than is usual in South-American examples; but as these latter offer considerable variation in this respect, too much stress must not be laid upon it.

E. caresa, though provided with a pencil of hairs near the base of the cell of the secondaries, as in *E. sophronisba*, has the wings of a very different shape, falcate instead of rounded. Its nearest South-American allies are *E. picea* and *E. cabira*, both described from Venezuela by Dr. Felder.

b. Male with a pencil of hairs near the base of the submedian nervure of the primaries beneath.

3. *Eunica alcmena*. (Tab. XXIII. figg. 6, 7 ♀.)

Callianira alcmena, Doubl. & Hew. Gen. Diurn. Lep. t. 28. f. 1¹.

Eunica alcmena, Godm. & Salv. Trans. Ent. Soc. 1880, p. 123².

Alis nigris, fascia subcostali a basin ad angulum apicalem (ad cellulæ finem fere interrupta) cærulea, posticis fascia submarginali eodem colore sed magis micante; subtus fuscescentibus, anticis ad apicem colore pallidiore notatis, posticis rufescenti-fuscis, maculis fusco-nigris variegatis, ocello bipupillato ad angulum apicalem aliisque duobus magnitudine diversis angulum analem propioribus.

Femina alis obscure brunneis, anticis ad apicem obscurioribus fascia transversa ultra cellulam alba.

Hab. MEXICO, Cordova (*Rümelî, Höge*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Polochic valley (*F. D. G. & O. S.*), Teleman (*Champion*), Choctum (*Hague*); PANAMA, Bugaba (*Arcé, Champion*).—COLOMBIA².

This is, perhaps, the best-known and commonest of all the Central-American species of *Eunica*, being found from Southern Mexico, where the types were procured, to Panama and the adjoining portion of Colombia. It is an inhabitant of the low-lying country, ranging from the sea-level to an altitude of perhaps 3000 feet. We have not yet seen it from Costa Rica.

4. *Eunica flora*.

Eunica flora, Feld. Wien. ent. Monatschr. vi. p. 111¹.

E. alcmenæ similis, sed fascia cærulea anticarum haud interrupta, ad angulum apicalem magis extensa, marginem externum totum fere attingente, fascia posticarum plerumque latiore; subtus alis omnino brunnescentioribus sed maculis fere similiter positis.

Hab. PANAMA, Chiriqui (*Ribbe*).—N. BRAZIL¹, Rio Negro (*Felder*); ECUADOR; PERU; BOLIVIA.

A single specimen in our possession obtained by Herr Ribbe in Chiriqui agrees in all essential particulars with our series of examples from Ecuador, Peru, and Bolivia, which we attribute to *E. flora* of Felder. The bands of blue, however, on both wings are rather narrow; but finding variation in this character, we are unwilling to lay too much stress upon it. Dr. Felder's specimen came from the upper Rio Negro; and the species seems to spread over the whole eastern slopes of the Andes and the Amazons valley as far east as Pebas. It is unknown from Colombia and Venezuela.

5. *Eunica pomona*. (Tab. XXIII. figg. 8, 9.)

Faunula pomona, Feld. Reise d. Nov. Lep. p. 407, t. 52. f. 11, 12¹.

E. alcmenæ quoque similis, sed colore alarum cyaneo magis purpurascente; colore quoque subtus magis brunnescente differt.

Hab. PANAMA, Bugaba (*Arcé, Champion*).—COLOMBIA¹.

Some time ago we received a single specimen of this Colombian species from Chiriqui, but recently others have reached us from Mr. Champion. They all agree with Felder's figure, and with specimens from Colombia, the typical locality. The species is allied to *E. alcmena*.

6. *Eunica amata*. (Tab. XXIV. figg. 1, 2.)

Eunica amata, Druce, Cist. Ent. i. p. 285¹.

E. alcmenæ affinis, sed colore cyaneo alarum multo magis purpureo et obscuro, subtus quoque maculis, præsertim ocellis multo minoribus differt.

Hab. COSTA RICA (*Van Patten*¹).

The two original specimens, which were in Dr. Van Patten's collection, and formed the subject of Mr. Druce's description, are all that we have seen of this species. It may at once be distinguished from all its congeners by the rich purple tint of the blue of the upper surface of the wings.

c. Male without pencils of hair on either wings.

c'. Median nervure of primaries not swollen, first branch thrown off not far from the base of the wing.

7. **Eunica augusta.** (Tab. XXIII. figg. 3, 4 ♂, 5 ♀.)

Eunica augusta, Bates, Ent. Monthl. Mag. iii. p. 135¹; Butl. & Druce, P. Z. S. 1874, p. 349².

Alis nigris, anticis dimidio basali cyaneo nitentibus fascia transversa subapicali alba, posticis ad basin tantum cyaneis; subtus fusco-nigris, anticarum apicibus et posticis undique nigro variegatis et atomis cæruleis perfusis.

Femina alis obscure virescentibus, anticarum apicibus late nigris et fascia lata alba transvittatis, subtus fere ut in mare.

Hab. MEXICO, Cordova (*Rümeli, Höge*); GUATEMALA, Polochic valley¹ (*Hague*), Teleman, San Gerónimo (*Champion*); COSTA RICA (*Van Patten*²); PANAMA, Chiriqui (*Arcé*).

Mr. Bates described this species from specimens sent us by Mr. Hague from the valley of the Polochic in Guatemala, and compared it with *E. calina* of Godart, with which, no doubt, it is closely allied; but its nearest relative is clearly *E. olympias* of Felder, from which it alone differs in having a white transverse band across the apex of the primaries. As will be seen above, its range extends throughout our region from Southern Mexico to Panama, where it is found in the hot low-lying forest-country. Immediately outside our border in Colombia *E. olympias* takes its place. We have figured the types, both from the valley of the Polochic.

8. **Eunica venusia.**

Faunia venusia, Feld. Reise d. Nov. Lep. p. 407, t. 52. f. 3-5¹.

Alis nigris, anticis productis et falcatis; posticis ad marginem externum plaga magna cæruleo lavata: subtus obscure fuscis, anticis præter apices nigris fasciis duabus viridi-cæruleis notatis, una brevi ad cellulæ medium, altera extra eam ad angulum analem extensa; posticis obscure fusco notatis, oculo magno bipupillato extra cellulam aliisque duobus magnitudine diversis ad angulum analem ornatis.

Hab. PANAMA, Bugaba (*Arcé*).—COLOMBIA¹.

Originally described from Colombia, this species is by no means uncommon in the State of Panama. In general appearance it is not unlike *E. excelsa*; but the brilliancy of the blue colouring of the posterior wings is reflected at a different angle. The markings on the basal half of the primaries beneath are bluish green, as in *E. celma* and *E. volumna*. This is not so in *E. excelsa*.

9. **Eunica excelsa.** (Tab. XXIII. figg. 12, 13.)

Eunica excelsa, Godm. & Salv. P. Z. S. 1877, p. 63¹.

E. venusiae similis, sed anticis cyaneo nitentibus, posticarum cyaneo magis notabili, subtus maculis omnibus magis distinctis, fasciis anticarum viridi-cæruleis omnino carentibus, differt.

Hab. PANAMA, Volcan de Chiriqui (*Arcé*), Bugaba (*Champion*).

A species peculiar to the Chiriqui district, in the State of Panama. Its allies are *E. aspasia* of Felder and *E. venusia* of the same author. From the former it differs in the greater extent of the smalt-blue of the anterior wings. The glistening blue of the secondaries is more refulgent than in either of the above-named species. The under surface almost exactly resembles that of *E. cinara* of Hewitson; but the differences on the upper surface are obvious. *E. excelsa* is by no means a common insect, few specimens having yet come into our hands; these are all males, the female being still unknown to us. We have figured one of the types from the volcano of Chiriqui.

10. *Eunica mygdonia*.

Nymphalis mygdonia, Godt. Enc. Méth. ix. p. 416¹.

Eunica mygdonia, Bates, Journ. Ent. ii. p. 196².

Eunica anna, Butl. & Druce, P. Z. S. 1874, p. 349³ (nec Cramer).

Alis fuscis, anticis punctis duobus subapicalibus albidis: subtus dilutioribus, anticis area mediana obscura fascia tripartita ultra cellulam transeunte punctisque duobus subapicalibus albidis; posticis ferrugineo lavatis, rufo-fusco variegatis, plagis magnis duabus hoc colore costam attingentibus.

Femina alis quam eæ maris pallidioribus, fascia alba transversa ultra cellulam et punctis tribus subapicalibus albis notatis.

Hab. GUATEMALA, Zapote (*Champion*); COSTA RICA (*Van Patten*³); PANAMA, Chiriqui (*Arcé*).—COLOMBIA and VENEZUELA to PERU and AMAZONS VALLEY²; BRAZIL¹.

According to Godart, the describer of this species, it is found in Brazil; but if we except the valley of the Amazons, where Mr. Bates met with it, we have no confirmation of its occurrence in that country. In Ecuador and Colombia, however, it is by no means uncommon, whence it spreads through Central America as far north as Guatemala. Dr. Van Patten's Costa-Rican specimen, which is now before us, certainly belongs to this species, and not to *E. anna*, as stated by Messrs. Butler and Druce³. Mr. Champion's specimens were all obtained at an elevation of about 2000 feet above the sea; they are larger than the general run of South-American examples, but differ in no important respect.

11. *Eunica malvina*.

Eunica malvina, Bates, Journ. Ent. ii. p. 195, t. 9. ff. 2, 2a¹; Godm. & Salv. Trans. Ent. Soc. 1880, p. 123².

Alis fuscis ad margines dilutioribus, anticis maculis subobsoletis apicem versus notatis: subtus griseo-albidis, anticis area mediana fusco-nigra fascia tripartita alba divisa; posticis rufo-brunneo variegatis maculis duabus costam attingentibus, ocellis duobus (annulo communi conjunctis) nigris cæruleo-albo pupillatis ultra cellulam aliisque duobus distinctis magnitudine diversis ad angulum analem.

Femina mari aliquot similis, anticis dimidio apicali obscuriore et fasciis duabus maculosis transfasciatis.

Hab. GUATEMALA, Zapote, El Tumbador (*Champion*); PANAMA, Calobre (*Arcé*).—COLOMBIA² and VENEZUELA to the AMAZONS VALLEY¹.

Mr. Bates discovered this species during his sojourn in the valley of the Amazons;

where he says it was nowhere common. We now trace it through Ecuador, Venezuela, and Colombia, as far north as Guatemala, specimens from which country in no way differ from the Amazonian types before us.

d'. Median nervure of primaries swollen at the base, first branch thrown off some way from the base of the wing.

12. *Eunica pusilla*.

Eunica pusilla, Bates, Journ. Ent. ii. p. 198, t. 9. ff. 5, 5a¹.

Alis fuscis violaceo tinctis, subtus rufescenti-brunneis, anticis ultra cellulam obscurioribus macula indistincta notatis; posticis lineis duabus per cellulam, aliis extra eam, una submarginali, ocellis duobus fere obsoletis ad angulum apicalem et duobus ad angulum analem notatis.

Femina mari similis, colore cæruleo absente, anticis ad apicem obscurioribus et fasciis maculosis transvittatis.

Hab. PANAMA, Bugaba, Calobre (*Arcé*), at sea off Punta Mala (*O. S.*).—COLOMBIA; VENEZUELA; LOWER AMAZONS¹; CUBA.

This species and *E. modesta* appear to be very closely allied; and the females perhaps are not always separable. The male, however, in the present insect is destitute of spots on the upperside of the anterior wings, whereas in *E. modesta* white spots on the apical half of these wings are very distinct. In their range it is noteworthy that *E. pusilla*, which has a much more eastern extension, is only found within our limits in the State of Panama, the only district unoccupied by *E. modesta*, which ranges from Mexico to Costa Rica, and reappears in Northern Colombia and some of the larger Antilles.

As regards the names for these two butterflies, there can be no doubt as to the application of Mr. Bates's titles, whose types are before us. It is a question, however, whether Cramer's name, *P. monima*, is not applicable to one of them; and it has already been used for *E. modesta* by Herrich-Schäffer in his 'Butterflies of the Island of Cuba.' As Cramer's figure is any thing but good, and his locality obviously erroneous, we prefer to adhere to a name about which no uncertainty exists.

Several specimens of *E. pusilla* were captured at sea a few miles off Punta Mala, on the coast of Panama, in company with other butterflies, in May 1873. They were probably in the act of migration.

13. *Eunica modesta*. (Tab. XXIII. figg. 15, 16.)

Eunica modesta, Bates, Ent. Monthl. Mag. i. p. 113¹; Godm. & Salv. Trans. Ent. Soc. 1880, p. 123².

Eunica monima, Strecker, N. Am. Butt. p. 140³.

E. pusillæ similis, anticis fasciis duabus maculosis transversis albidis in dimidio apicali obscuriore notatis.

Femina mari similis, colore cæruleo absente.

Hab. NORTH AMERICA, Texas, Florida³.—MEXICO, Cordova (*Rümeli*); GUATEMALA¹, central valleys (*F. D. G. & O. S.*), San Gerónimo (*Champion*), Polochic valley (*Hague*);

NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA, Irazu (*Rogers*).—COLOMBIA²; GUIANA; ANTILLES, Cuba, Haiti.

Described by Mr. Bates from specimens obtained by us in Guatemala, where we have since found it to be common in the low-lying lands of Vera Paz up to an elevation of 3000 feet. It is also common in Mexico, judging from the number of specimens that have reached us; and it is doubtless the same species which Mr. Strecker calls by Cramer's name of *E. monima*, giving its range into Texas and Florida³.

We have already alluded to the differences between this species and *E. pusilla*, and to the possibility of Cramer's name *Papilio monima* being applicable to it.

Our figure represents a male from Central Guatemala.

14. **Eunica tatila.** (*Eunica cærulea*, Tab. XXIII. fig. 14.)

Eunica tatila, H.-Sch. Samml. ansereur. Schm. ff. 69-72¹.

Eunica cærulea, Godm. & Salv. P. Z. S. 1877, p. 64²; Trans. Ent. Soc. 1880, p. 123³.

Alis fuscis, area interna violaceo suffusis, anticis apice excisis, dimidio apicali fasciis duabus maculosis albis transvittato punctoque ejusdem coloris inter ramos medianos; subtus maculis sicut in pagina superiore, posticis fuscis fere unicoloribus sed serie ocellorum submarginalium fere obsoleta notatis.

Femina mari similis, sed area alarum interna cyaneo nec violaceo suffusa, subtus posticis maculis clarioribus et interdum linea longitudinali fulva notatis.

Hab. MEXICO, Cordova (*Rümeli*); GUATEMALA, Polochic valley (*Hague*²).—COLOMBIA³; ANTILLES, Cuba¹, Haiti.

Since describing this species under the name of *E. cærulea* we have received a large series of specimens of both sexes from Mexico. From these it appears that there is considerable sexual difference in the coloration of this species, the wings of the males being suffused with violet-purple, while those of the females are blue. Our Haitian specimens are all females, whilst those from Guatemala are all males; hence the source of our error.

The characters of the upperside in both sexes are extremely constant; but the under surface of the secondaries varies from a uniform dark brown to a much lighter colour. Some of our specimens are mottled with rufous, while two females from Mexico have a broad longitudinal buff line running from the base to the middle of the outer margin.

The locality of Herrich-Schäffer's types is not given with precision; but he afterwards calls Cuban specimens by this name. We now know it to be common in Southern Mexico and in some parts of Guatemala. It appears to be absent from the rest of Central America; but it reappears in Northern Colombia, where Mr. Simons found it³.

MYSCELIA.

Myscelia, Section I., Doubleday, Gen. Diurn. Lep. p. 220 (1849).

This genus seems best restricted to about nine species, all more or less allied to *M. cyaniris* of Doubleday, and forming the first section of the wider group included in

Myscelia by that author, who not only placed the whole of the genus *Eunica* in it, but also the females of *Epicalia*, whose relationship at that time was not understood.

Of the nine species known to us, no less than six are found in our region; and of these certainly three, and perhaps four, are not found beyond it, as will be seen below. Of the external species one, *M. orsis*, is peculiar to South-eastern Brazil, but has a closely allied race, as yet unnamed, in the Lower Amazons valley. The third species, *M. antholia*, is the largest and finest of the whole genus, and is peculiar to the island of Haiti.

M. orsis and its Amazons ally are distinguished by the difference in the coloration of the sexes; and the males are further differentiated by having the inner margin of the primaries convex and covering a black patch over the middle of the subcostal nervure of the secondaries. *M. cyaniris* has this black patch in a slight degree; but the sexes do not differ much in coloration. In *M. leucocyanea* there is a sexual difference, in that two of the blue stripes of the secondaries become almost fused in the male but not in the female. The same appears to be the case in *M. ethusa* and *M. pattenia*; but of these species we have never seen females. In *M. cyanthe* the fusion of the two bands is complete.

The subcostal nervure in *Myscelia* throws off two branches before the end of the cell; the upper discocellular is very short, and the chords of the middle and lower run at large obtuse angles to the subcostal, so that the lower discocellular meets the median some way beyond the origin of the second branch (not close to it as in *Eunica*, *Epiphile*, &c.). The costal and median nervures are gradually but slightly swollen towards the base. The front legs of the male are slightly hairy; coxa $> \frac{1}{2}$ femur + trochanter; tibia $<$ femur; tarsus (single-jointed) $= \frac{2}{3}$ tibia. Middle and posterior legs moderately spined; claws short, moderately curved. Palpi hairy, terminal joint (in both sexes alike) rather long; middle joint not swollen. Antennæ with 41 joints, the terminal 12 forming a moderate club. The secondary male sexual organs have a well-developed tegumen, with a long slightly depressed central hook; the harpagones are feeble, not projecting beyond the point of the tegumen, without hooks or projections, but hairy towards the extremity, especially on the ventral surface.

- a. Male with an indistinct black spot on the upper surface of the secondaries over the middle of the subcostal nervure.

1. *Myscelia cyaniris*.

Myscelia cyaniris, Doubl. & Hew. Gen. Diurn. Lep. p. 222, t. 27. f. 2¹.

Cybdelis cyaniris, Boisd. Lép. Guat. p. 40².

Alis fuscis, nitide cyaneo perfusis, anticis valde hamatis vena radiali superiore producta, anticarum costæ dimidio proximo, striga cellulari et altera infra eam griseo cærulescentibus, hac albescentiore, macula irregulari ejusdem coloris ad angulum analem: dimidio anticarum apicali maculis variis albis ornato; posticis strigis quatuor griseo cærulescentibus transversis, duabus proximis puncto albido extus terminatis: subtus fuscis, anticis ad apicem et posticis omnino pallidioribus ferrugineo-fusco irroratis. Femina mari similis, colore nitide cyaneo absente.

Hab. MEXICO ¹ (*Sallé*), Cordova (*Rümelí*), Yucatan (*Hedemann*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA ², Choctum (*Hague*), San Isidro, Coatepeque, Las Mercedes (*Champion*); HONDURAS ¹: NICARAGUA, Chontales (*Belt, Janson*); PANAMA, Bugaba (*Champion*), Lion Hill (*M. Leannan*).—COLOMBIA; ECUADOR.

This is one of the commonest species of the genus, being found from Southern Mexico to Ecuador. It is an inhabitant of the low-lying country of both coasts of Guatemala. It may be distinguished from all its allies by the blue sheen suffused over both wings of the male.

b. Both sexes alike as to the number of bands on the secondaries.

2. *Myscelia rogenhoferi*. (Tab. XXIV. figg. 3, 4.)

Myscelia rogenhoferi, R. Feld. Verh. k. k. zool.-bot. Ges. Wien, 1869, p. 472 ¹.

Alis fuscis, fasciis et maculis quoad situs iis *M. cyaniri* similibus sed cærulescentioribus (maculis in dimidio anticarum apicali albis exceptis); subtus posticis multo saturatioribus, griseo et fusco pulcherrime marmoratis, fasciis duabus transversis et angulo apicali dilutioribus.

Femina mari similis, sed alarum coloribus magis obscuris.

Hab. MEXICO, Mazatlan (*Forrer*), Huahuapan (*Hedemann* ¹), Vera Cruz and Cuernavaca (*Sallé* ¹), Cordova (*Rümelí*), Oaxaca (*Deppe*); NICARAGUA (*coll. Hewitson*).—COLOMBIA ¹.

This species was first described by Rudolph Felder from specimens obtained by Lieut. Hedemann at Huahuapan, in Mexico; but Mons. Sallé had previously met with it, and some fifty years ago Deppe obtained the examples which are now in the Berlin Museum. In its general appearance it is not unlike *M. ethusa*; but, besides having all the spots in the distal half of the anterior wing white, the blue bands of the posterior wings are distinct, as in *M. cyaniris*, the third and the penultimate band in *M. ethusa* coalescing towards the apical angle. *M. cyaniris* is probably its nearest ally; but the blue gloss present in that species is wholly absent, and there are other differences. We have no authentic specimens from any country except Mexico; but there is one in the Hewitson collection in the British Museum which is marked as coming from Nicaragua, and its occurrence in Colombia is recorded by Felder, a male being in his collection from Santa Marta.

c. Secondaries with three distinct median bands in the male, four in the female.

3. *Myscelia leucocyanea*.

Myscelia leucocyanea, Feld. Wien. ent. Mon. v. p. 106 ¹; Reise d. Nov. Lep. p. 408, t. 53. f. 8, 9 ².

Alis supra fuscis, anticis fascia discali, altera supra venam medianam, duabus obliquis marginem internum attingentibus et punctis duobus ad cellulæ finem grisescenti-cæruleis, maculis duabus ad cellulæ finem aliisque duodecim in dimidio alarum apicali albis; posticis striga basali brevi, lunulis submarginalibus ad angulum analem aliisque tribus transversis (ea in medio ad marginem internum bifurcata) grisescenti-cæruleis: subtus anticis ut supra maculatis, apice et posticis omnino fuscis nigro irroratis et marmoratis.

Femina mari similis, sed colore grisescenti-cæruleo pallidiore et violaceo tincto et posticis fascia transversa mediana longitudinaliter omnino divisa; subtus alis dilutionibus, posticis plaga discali magna fusco-nigra.

Hab. NICARAGUA, Chontales (*Belt, Janson*); PANAMA, Bugaba (*Champion*), Veraguas (*Arcé*), Lion Hill (*M'Leannan*).—VENEZUELA ¹.

Dr. Morritz discovered this species in Venezuela; and his specimens, both females, formerly in Dr. Kaden's collection, now in our own, were described by Dr. Felder and subsequently figured in the 'Voyage of the Novara.' We have since traced the species through the State of Panama and as far north as Nicaragua; but none have as yet come before us from Costa Rica. *M. leucocyanea* belongs to the *M. ethusa* section rather than to that containing *M. cyaniris*, as there is a long discocellular blue streak on the primaries of the male and four instead of five blue cross bands on the secondaries, the third and fourth being fused, the submarginal band thus becoming the fourth instead of the fifth. The female closely resembles that sex in *M. cyaniris*; but, besides being smaller, it always has two white spots at the end of the cell of the primaries, which are not shown in the other species.

4. *Myscelia ethusa*.

Cybdelis ethusa, Boisd. in Cuv. Règ. An. Ins. Atl. ii. t. 138. f. 3¹.

Myscelia ethusa, R. Feld. Verh. k. k. zool.-bot. Ges. Wien, 1869, p. 472, note².

Myscelia cyanecula, Feld. Reise d. Nov. Lep. p. 408, t. 53. f. 5³.

M. leucocyaneæ affinis, sed fasciis alarum cyaneo saturationibus et violaceo tinctis, maculis intra cellulam et ultra eam ejusdem coloris nec albis, iis ad apicem exceptis; subtus alis multo obscurioribus.

Hab. MEXICO ¹ (*Sallé*³), Huahuapan (*Hedemann*), Cordova (*Rümeli*).

An excellent figure of this species was given by Boisduval in Cuvier's 'Règne Animal'¹; and it was again figured by Felder in the 'Voyage of the Novara'³. The identity of the insect represented by these two figures was subsequently shown by Rudolph Felder in a note to the short paper describing the new species in Lieut. Hedemann's collection². *M. ethusa* is a scarce species in Southern Mexico; and we have no record of its occurrence elsewhere.

Boisduval (Lép. Guat. p. 40) mentions two species from Honduras under the names *Cybdelis ethusa* and *C. cyanecula*. If the locality is correct, the specimens should probably both be called *M. pattenia*.

5. *Myscelia pattenia*.

Myscelia pattenia, Butl. & Druce, Cist. Ent. v. p. 101¹; P. Z. S. 1874, p. 347²; Butl. Lep. Ex. p. 172, t. 60. f. 1³.

E. ethusæ similis, et fasciis alarum ejusdem coloris, sed maculis ultra cellulam albis nec cyaneis, fasciis quoque posticarum plerumque angustioribus distinguenda, ab *E. leucocyanea* maculis duabus albis in cellulæ fine nullis diversa.

Hab. GUATEMALA, central valleys (*F. D. G. & O. S.*), Chisoy valley (*Hague*); COSTA RICA (*Van Patten*^{1 2 3}).

M. pattenia takes the place of *M. ethusa* in Guatemala and Costa Rica; but it is a very scarce species in both countries, three specimens being all that have come under our notice. Its chief and obvious difference from *M. ethusa* consists in the spots in the anterior wings beyond the cell being white instead of blue, the stripes alone being of the latter colour. The single specimen obtained by us was probably from the neighbourhood of San Gerónimo, as that received from Mr. Hague was captured in the lower part of the same valley.

The type from Costa Rica was the only specimen in Van Patten's collection, and, being a male, cannot be the opposite sex of *M. cyananthe*, as suggested by Messrs. Butler and Druce¹.

6. *Myscelia cyananthe*.

Myscelia cyananthe, Feld. Reise d. Nov. Lep. p. 408, t. 53. f. 6, 7¹.

M. ethusæ quoque affinis, sed alis multo magis nigricantibus fasciis alarum cæruleis abbreviatis et anticis maculis albis nullis primo visu distinguenda.

Hab. MEXICO¹, Oaxaca (*Deppe*).

A single specimen in the late Dr. Kaden's collection formed the subject of Dr. Felder's description and figure of this fine species; but many years previously the indefatigable collector Deppe had sent three specimens from Oaxaca to the Berlin Museum. There are three examples also in the British Museum and one in the Vienna Museum; but the species is evidently a scarce one. *M. cyananthe* is remarkable for the prevalence of the intense black on the upper wings. The blue marks which characterize both it and its allies are reduced to a few spots near the apex of the primaries and three streaks near the base, white spots being wholly absent. The secondaries have two broad bands and the outer margin blue, the rest of the wings being black.

Note.—Boisduval, in his 'Lépidoptères de Guatemala,' includes a species, possibly of this genus, from Nicaragua, as "*Cybdelis lycopsis*, Klug." This is apparently a manuscript name, and we have no clue to what species it refers.

EPIPHILE.

Epiphile, Doubleday, Gen. Diurn. Lep. p. 224 (1849).

Epiphile contains fourteen species now known to us, which are spread over the Neotropical Region, to the exclusion of Guiana and the Amazons valley, from Mexico to South Brazil. The focus of the genus is Colombia and Venezuela, where seven species are known to occur. Two species are found in South Brazil, and two in Bolivia and Peru, whilst five occur within our limits, only one of which (*E. eriopis*) is also an inhabitant of Colombia.

The genus seems to be divisible into two sections, according as the sexes are approximately alike or widely different.

The subcostal nervure in *Epiphile* emits two branches before the end of the cell; the upper discocellular is very short, the chord of the middle discocellular nearly at right angles to the subcostal, the chord of the lower at a small obtuse angle to it, the lower discocellular meeting the median nervure close to the origin of the second branch, as in *Eunica*. The costal margin of the secondaries is slightly concave in the middle. The front legs of the male are hairy; coxa $> \frac{1}{2}$ femur + trochanter; tibia = femur; tarsus (single-jointed) a little $<$ tibia. Middle and posterior legs slightly spined, claws short and much curved. The eyes are hairy. The palpi slightly hairy, the terminal joint (shorter in the male than in the female) long, nearly as long in the female as the middle joint, but neither of them swollen. Antennæ 37-jointed, the terminal 12 forming a moderate club. The secondary male sexual organs have a tegumen with a long hooked central spine; the harpagones are very feeble, narrow, and without hooks or spines, but hairy towards the distal end.

a. Sexes approximately alike in coloration.

1. *Epiphile adrasta*.

Epiphile adrasta, Hew. Ex. Butt. *Epiphile*, t. 2. ff. 9-11¹; Butl. & Druce, P. Z. S. 1874, p. 346²; Boisd. Lép. Guat. p. 40³.

Alis nigris purpureo tinctis, fasciis duabus obliquis transeuntibus flavido-fulvis, una omnino in anticis extracellulam a costa ad angulum analem ducta, altera, basin anticarum versus, a costa ad medium marginis posticarum externi: subtus anticis ut supra ocello ad angulum apicalem; posticis rufescente fusco variegatis, macula triangulari in costæ medio flava et serie ocellorum indistincte notata margini externo parallela.

Femina mare distinguenda fascia anticarum externa flavido-albida et alis omnibus ad basin fulvis fascia interna vix apparente, anticis puncto albo apicali notatis.

Hab. MEXICO¹ (*Sallé*³), Cordova (*Rümeli, Höge*), Oaxaca (*Fenochio*); GUATEMALA, Yzabal, Motagua valley (*F. D. G. & O. S.*), Polochic valley (*Hague*), El Tumbador (*Champion*), San Gerónimo (*Hague, Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²), Cache (*Rogers*); PANAMA, Bugaba (*Arcé, Champion*), Volcan de Chiriqui, 2500 to 4000 feet (*Champion*).

A common species throughout Central America, from Southern Mexico to Panama, and probably the commonest of the genus. It is very constant in its markings; in some male specimens, however, we notice a small white spot in the apex of the primaries, and in some, but not in all, the apex itself is tawny. In its vertical range *E. adrasta* reaches to about 3000 feet, being found at all lower elevations down to the sea-level. It flies in the scrubby vegetation rather than in thick forest.

Hewitson first described the species from Mexican specimens, adopting for the species a manuscript name of Boisduval's¹, who applied it to examples collected by M. Sallé³.

Mr. Champion has sent us several paired specimens taken together; so that the sexes of this species are satisfactorily determined.

2. *Epiphile eriopis*.

Epiphile eriopis, Hew. Ex. Butt. *Epiphile*, t. 1. ff. 5, 6¹.

Alis nigris, anticis fascia obliqua ultra cellulam et apice ipso albis, fascia lata communi a basi anticarum ad medium marginis posticarum externi transeunte fulva; subtus anticis fere ut supra, apice fulvescente oculo indistincto notato, posticis rufescente brunneo marmoratis area anali pallidiore, macula triangulari argenteo-fulva ad medium marginis externi.

Femina adhuc ignota.

Hab. NICARAGUA, Chontales (*Belt*).—COLOMBIA¹.

Colombia is the country whence this species has hitherto been procured, and where Hewitson's types were obtained¹. Belt's collection, however, contained a single example showing the northern extension of the species into our region.

E. eriopis is a beautiful species, having no near allies, but belonging apparently to the same group as *E. adrasta* and *E. chrysites* (Latr.) &c.

b. Sexes widely divergent in coloration.

3. *Epiphile grandis*. (Tab. XXIV. figg. 5, 6 ♂, 7 ♀.)

Epiphile grandis, Butl. Cist. Ent. i. p. 76¹; Lep. Ex. p. 152, t. 54. f. 4²; Butl. & Druce, P. Z. S. 1874, p. 347³.

Alis nigris violaceo saturate suffusis, fascia obliqua ad apicem et altera inferiore ultra cellulam anticarum ad marginem externum posticarum extendente fuscis; anticis costa ad basin et litura infra eam margineque posticarum externo rufis; subtus fere ut in *E. adrasta* sed coloribus omnibus saturatioribus.

Femina alis fuscis, anticis ad apicem obscurioribus et punctis tribus notatis fascia lata obliqua ultra cellulam fulva, posticis margine apicali ejusdem coloris; subtus fere ut supra, sed alis dilutioribus, posticis rufo-fusco marmoratis.

Hab. GUATEMALA, Purula (*Champion*); COSTA RICA (*Van Patten*^{1 2}).

This name was founded on a single female specimen contained in Van Patten's collection, and was subsequently figured by Mr. Butler. Quite recently Mr. Champion has sent us from Purula, in Guatemala, a male of a large and beautiful species previously unknown to us, but which we now feel confident is the male of the Costa-Rican insect.

Single specimens only having occurred in the large collections of Dr. Van Patten and Mr. Champion shows, we think, how scarce this fine insect must be. The male resembles no other species of the genus with which are acquainted; but the female, as Mr. Butler remarks, is not unlike that sex of *E. oreia*, but is of course much larger.

4. *Epiphile plutonia*. (Tab. XXIV. figg. 8, 9 ♂, 10 ♀.)

Epiphile plutonia, Bates, Ent. Monthl. Mag. i. p. 113¹.

Alis nigro-fuscis, anticis fascia obliqua ultra cellulam fulva, macula cellulari transversa ejusdem coloris, puncto

ad apicem albo; posticis area discali læte cyanea: subtus alis rufescentioribus anticarum apicibus et posticis fusco marmoratis, macula triangulari argenteo-flavida ad costæ medium notatis. Femina alis brunneis, apicibus obscurioribus et puncto albo notatis, fascia lata obliqua ultra cellulam et angulo posticarum apicali fulvis; subtus alis ochraceo rufescentibus fusco marmoratis, fasciæ anticarum fulvæ marginibus nigricantibus, macula posticarum costali sicut in mare.

Hab. GUATEMALA, Polochic valley (*F. D. G. & O. S.*¹), Purula, Paraiso (*Champion*).

This species is at present only known to us from Guatemala, where, however, though very few specimens have come to us, it is pretty widely distributed. Mr. Bates, when describing this species, compared it with *E. epicaste* of Hewitson; but it is in fact a northern race of the Brazilian *E. oreä*, and the still more northern *E. iblis*, a fourth race being *E. plusios*, the insect next described. From *E. iblis*, *E. plutonia* differs in having a white spot in the apex of the primaries instead of a tawny band of contiguous spots. The innermost tawny band consists of a discocellular spot, which is not continued onwards towards the anal angle as in the allied species.

The female agrees exactly with Hewitson's representation of that sex of *E. oreä*, the cross band of the primaries being narrower than in the females of either the next species or of *E. iblis*.

The type being in bad condition, we have figured a male specimen from Purula, and a female from Paraiso, both captured by Mr. Champion.

5. *Epiphile plusios*, sp. n.

E. plutoniæ valde similis, sed fascia anticis ultra cellulam obliqua angustiore et fascia altera per cellulam ad angulum analem extensa notatis; posticis colore cæruleo forsan magis nitente.

Hab. COSTA RICA, Cache and Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Arcé*).

This is the race of *E. oreä* found in Costa Rica and Panama. It has a white apical spot on the primaries as in *E. plutonia*; but the interior tawny band is much the same as in *E. iblis*. The blue patch of the secondaries is perhaps a little lighter than in any of the allied forms. The female has the tawny band of the primaries intermediate in width between that of *E. plutonia* and *E. iblis*. We have only seen three specimens of this form, one of each sex from Costa Rica, and a male from the Volcan de Chiriqui.

Note.—Besides the above species, Boisduval includes in his 'Lépidoptères de Guatemala' two Colombian species of *Epiphile* as occurring within our limits, viz. *E. chrysites* (Latr.) and *E. epicaste*, Hew. Both are said to have been obtained in Nicaragua; but we have no evidence confirming this extension of their range.

BOLBONEURA.

Bolboneura, Godman & Salvin, P. Z. S. 1877, p. 62.

A single species at present constitutes this genus, which is restricted in its range to Southern Mexico and Guatemala.

The position of *Bolboneura* is somewhat intermediate between *Eunica*, *Temenis*, and *Epiphile*, having the swollen costal and median nervures of some members of *Eunica*; but this character is much more developed in *Bolboneura*. The palpi are elongated as in *Epiphile* &c.; but the eyes are smooth, and the anal angle of the secondaries rounded and not produced.

As in *Epiphile*, the subcostal nervure emits two branches before the end of the cell, the upper discocellular is short, the chords of the middle and lower discocellulars stand at less than two right angles to one another, the former making an obtuse angle with a tangent to the subcostal; the lower discocellular meets the median just beyond the origin of the second branch; the costal and median nervures are much swollen at their bases. The front legs of the male are very slightly hairy; coxa $> \frac{1}{2}$ femur + trochanter; tibia = tarsus; tarsus (single-jointed) $> \frac{2}{3}$ tibia. Middle and posterior legs hairy but not spiny beneath; claws short, strongly curved. Eyes smooth. Palpi hairy; terminal joint elongated (more so in the female than in the male), ovate; middle joint stout and swollen. Antennæ 33-jointed, terminal 12 forming a moderate club. The secondary male sexual organs are very much like those of *Epiphile*; the tegumen has a central spine elongated and depressed into a hook; the harpagones are feeble, hairy at the end, but without spines.

1. *Bolboneura sylphis*. (Tab. XXIV. figg. 11, 12.)

Temenis sylphis, Bates, Ent. Monthl. Mag. i. p. 113¹.

Bolboneura sylphis, Godm. & Salv. P. Z. S. 1877, p. 62².

Alis anticis extus dentem ferentibus, posticis margine externo omnino dentato, anticis dimidio apicali fasciis duabus ochraceis transvittato, dimidio basali et area posticarum interna rosaceo-cæruleis, a margine fusco rufo separatis linea submarginali chalybeo-cæruleo: subtus anticis fuscis, apice flavido variegato, basi et fascia obliqua transversa flavis, ad cellulæ finem linea transversa chalybeo-cærulea; posticis griseis rufo-fusco variegatis, maculis magnis hujus coloris apud costæ medium et ad angulum analem, macula triangulari costali flava sicut in genere *Epiphile*.

Femina mari similis sed paulo major.

Hab. MEXICO (*Deppe*); GUATEMALA, valleys of the interior (*F. D. G. & O. S.*¹), Polochic valley (*Hague*), San Gerónimo (*Champion*).

Though the specimens we obtained in Guatemala in 1862 were the first that were described of this pretty species, Deppe, as has so frequently been the case, had sent specimens to the Berlin Museum from Mexico some fifty years previously. In Guatemala *B. sylphis* is by no means common; but we have recently received from our excellent collector Mr. Champion several examples all taken in the neighbourhood of San Gerónimo.

TEMENIS.

Temenis, Hübner, Verz. bek. Schm. p. 34 (1816); Bates, Journ. Ent. ii. p. 203.

Temenis, as restricted by Mr. Bates, contains two species—one the very variable insect mentioned below, the other *T. pulchra* (Hew.), which possibly should be separated generically from *T. ariadne*. The genus is spread over the whole of the Neotropical Region, and is closely allied to *Epiphile*, from which its smooth eyes at once distinguish it.

The subcostal nervure in *Temenis* throws off two branches before the end of the cell; the upper discocellular is very short, the middle curved; its chord and that of the lower discocellular are in the same line, which lies at a small obtuse angle to the subcostal; the lower discocellular meets the median at the origin of the second branch; neither the costal or median nervures are swollen at their bases. The front legs of the male are slightly hairy; coxa $> \frac{1}{2}$ femur + trochanter; tibia $<$ femur; tarsus (single-jointed) = tibia. Claws of middle and posterior legs feeble, moderately curved. Eyes smooth. Palpi slightly hairy, terminal joint in the male $< \frac{1}{2}$, in the female $> \frac{1}{2}$ the middle joint as in *Epiphile*; middle joint slightly thickened towards the distal end. Antennæ with 41 joints, the terminal 14 forming a moderate club. The secondary male sexual organs have a tegumen with prolonged, central, decurved spine; the harpagones project to the end of the tegumen, and have a broad lobe without hooks or spines, but are hairy towards the distal end.

1. *Temenis ariadne*.

Papilio ariadne, Cram. Pap. Ex. t. 132. ff. A, B¹.

Temenis ariadne, Bates, Journ. Ent. ii. p. 203²; Butl. & Druce, P. Z. S. 1874, p. 347³.

Papilio agatha, Fabr. Mant. Ins. ii. p. 54⁴.

Papilio liberia, Fabr. Syst. Ent. iii. p. 135⁵; Don, Ins. Ind. t. 30. f. 4⁶.

Alis anticis extus angulatis, posticis angulo anali sensim producto; alis fulvis anticarum apicibus obscurioribus plaga fulva interdum indistincte inclusa, posticis interdum puncto nigro inter ramos medianos primum et secundum; subtus posticis paulo obscurioribus, ocellis quatuor submarginalibus et lineis submarginali lunulari ornatis.

Femina mari similis at paulo major, posticis minus productis.

Hab. MEXICO, Oaxaca (*Fenochio*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Polochic valley, Choctum (*Hague*), San Gerónimo, Dueñas (*F. D. G. & O. S.*), Teleman, Tocoý, San Isidro (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*⁵); PANAMA, David (*Champion*), Calobre (*Arce*).—SOUTH AMERICA, Colombia to Paraguay.

Most of the many varieties of this widely spread species have been fully described by Mr. Bates², to whom it was well known during his sojourn in the valley of the Amazons. Of the varieties there mentioned, two occur in our region, the palest form (*P. liberia*, Fabr.⁵) being the commonest in Mexico and Guatemala, whilst in Nicaragua, and thence into Colombia, the variety with darker apex to the primaries (*P. agatha*, Fabr.⁴) prevails.

We have not yet met with any representatives in our region of the variety represented by Hübner as *Temenis merione*, nor yet of that called by Cramer *Papilio laothoe*. The two Central-American varieties are not strictly localized as indicated above; for in Guatemala the dark-tipped insect occurs with the lighter one, though more sparingly.

Temenis ariadne in Guatemala enjoys a wide range in altitude, being found from nearly the sea-level at Teleman to 5000 feet above the sea at Dueñas. It is a forest-loving species, though not always forest of the densest kind.

NICA.

Nica, Hübner, Samml. ex. Schm. ii. t. 17; Bates, Journ. Ent. ii. p. 204.

Three species are included in *Nica*, all of which are very closely allied, if indeed they are really separable. *N. flavilla* is the Brazilian race; *N. sylvestris* that of the Amazons valley; and *N. canthara* is found in Venezuela and Colombia, and thence northwards to Guatemala.

In its general coloration *Nica* much resembles the lighter forms of *Temenis*; but the hind wings are more rounded and less produced at the anal angle than in that genus. A dark transverse line crosses both wings beneath—a character *Nica* has in common with *Peria*, but which is not found in *Temenis*.

The subcostal nervure in *Nica* throws off the first branch before the end of the cell, the second at the junction of the short upper discocellular; the chords of the middle and lower discocellular nervules are in a line running at right angles to the subcostal, and meeting the median a little beyond the origin of the second branch; neither the subcostal nor the median nervures are swollen at their bases. The front legs of the male are slightly hairy; coxa stout, $> \frac{1}{2}$ femur + trochanter; tibia thickened at its distal end, $<$ femur; tarsus thickened at its proximal end, $<$ tibia. Eyes smooth. Palpi slightly hairy, terminal joint rather $> \frac{1}{3}$ middle joint, which is slightly swollen towards its distal end. Antennæ with 31 joints, the terminal 12 forming a rather abrupt club. The male secondary sexual organs have a tegumen with a long central spine, which is abruptly depressed into an almost recurved hook; the harpagones project beyond the tegumen, are hairy at the end, but have no spines.

1. *Nica canthara*.

Myscelia canthara, Doubl. Gen. Diurn. Lep. p. 226¹.

Nica flavilla, Butl. & Druce, P. Z. S. 1874, p. 344².

Alis posticis rotundatis margine externo sensim undulato; supra alis fulvis, anticarum apicibus fuscis aut nigris interdum maculam includentibus; subtus ochraceo-flavidis linea communi transversa extra cellulas fusca, lineis undulatis duabus submarginalibus fulvidis, anticarum apicibus ocellis albo pupillatis duobus, posticis duobus ad costam extra lineam transversam altero versus angulum analem.

Hab. GUATEMALA, Panan, Pantaleon, San Gerónimo (*Champion*), Pacific slopes, Motagua and Polochic valleys (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt*); COSTA

RICA (*Van Patten*²), Caché (*Rogers*); PANAMA, Bugaba (*Arcé*), Chiriqui (*Champion*), Lion Hill (*M^r Leannan*).—COLOMBIA; VENEZUELA¹; JAMAICA.

Though differences can be traced between some Guatemalan specimens of this species and those from Nicaragua &c., we hesitate to separate them, as neither are very constant in their markings. The more northern specimens have a less distinct dark apex to the primaries, and the tawny spot sometimes almost blends with the rest of the wing thus coloured. Nicaraguan examples, as well as those found in Costa Rica and Panama, agree with Colombian and Venezuelan specimens, and belong, no doubt, to the species from the latter country named *N. canthara*. Guatemalan specimens, on the other hand, are not unlike the Brazilian *N. flavilla* as figured by Hübner; but they have no indication on the upperside of the dark transverse band which crosses both wings beneath.

The Amazonian form, *N. sylvestris*, Bates, has a dark apex to the primaries, in which is a white spot.

In the variations of the dark apex of the primaries, *N. canthara* seems to follow exactly the modifications of that of *Temenis ariadne* found in the same district.

In Guatemala *Nica canthara* is not uncommon in the hotter parts of the country up to an elevation of about 3000 feet.

EPICALIA.

Epicalia, Westwood, Gen. Diurn. Lep. p. 256 (1850).

Catonephele, Hübner, Verz. bek. Schm. p. 40; Kirby, Cat. Diurn. Lep. p. 202.

The genus *Epicalia* contains about seventeen species, all of which are confined to the Neotropical Region. In Central America we know of five species, three of which reach Southern Mexico, and are distributed over nearly the whole of our region. Of the other two, one (*E. chromis*) is found in Costa Rica and the adjoining parts of Panama, and reappears again in the Sierra Nevada de Santa Marta; the fifth is the widely dispersed *E. acontius*, which just enters our borders in the State of Panama. In most of the species of *Epicalia* the sexes are very different in their markings—so much so, that for a long time males and females were treated as different species. Mr. Bates's observations, however, made when resident in the valley of the Amazons, enabled him to correct the errors of his predecessors; and with the clue thus afforded the sexes of the different species have now been correctly paired so far as we can see.

In *Epicalia* the subcostal nervure throws off two branches before the end of the cell: the upper discocellular is very short, the middle angular, its chord running nearly at right angles to the subcostal; lower discocellular nearly straight, in a line with the chord of the middle discocellular, and meeting the median nervure some way beyond the origin of the second branch; the costal nervure somewhat swollen towards its base, the median not so. The front legs of the male are slightly hairy; coxa $> \frac{1}{2}$ femur +

trochanter; tibia < femur; tarsus (single-jointed) = tibia. Claws of middle and posterior legs moderately curved. Eyes smooth. Palpi slightly hairy, terminal joint about $\frac{1}{3}$ middle joint (in *E. nyctimus* about $\frac{1}{2}$), which is slightly thickened towards the distal end. The antennæ have 39 joints, whereof the terminal 12 form a moderate club. The secondary male sexual organs have a tegumen with a long, slightly depressed, central spine, the harpagones are simple lobes, hairy at the end, and reaching to the end of the tegumen. In addition to these parts is a separate chitinous piece, probably present in most Nymphalidæ, which, starting from the ventral surface of the distal end of the seventh segment of the body, extends in two rods almost to the end of the harpagones, and have some strong spines at their distal ends. This character seems unusually developed in some species of *Epicalia*.

- a. Costa of secondaries much rounded to cover a large pencil of hairs on the underside of the primaries.

1. *Epicalia acontius*.

Papilio acontius, Linn. Mant. p. 537¹.

Epicalia acontius, Bates, Journ. Ent. ii. p. 202²; F. Müll. Arch. d. Museu Nac. ii. p. 31, t. 3³.

Papilio medea, Fabr. Syst. Ent. p. 508⁴.

Alis supra brunneo-nigris, fascia communi lata fulva a ramo discocellulari inferiore anticarum ad medium marginis interni posticarum; subtus nebuloso-sericeo-fuscis, anticarum ad apicem albicantibus.

Femina major, anticis magis productis, alis trifasciatis fasciis prima et media extus maculosis, tertia fere omnino maculosa et omnibus flavis, posticis linea flavicante submarginali, angulo anali rubro-fulvo; subtus anticarum apicibus et posticarum nebuloso-griseis, lineis indistinctis notatis.

Hab. PANAMA, Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—SOUTH AMERICA, from Colombia to Brazil².

Of this widely spread species we have as yet only seen two female specimens captured within our border; but it is possibly this species to which Boisduval refers (Lép. Guat. p. 41) under the name *Epicalia antinoe*, the females of the two insects being very similar in their markings. The male, however, of *E. acontius*, besides wanting the apical tawny spot in the primaries, has the peculiar tuft of hairs on the underside of the primaries so well described by F. Müller³. Though rare in Panama, it is common, according to Mr. Bates², in the Amazons region and in Guiana. We have also a good supply of specimens from Colombia, just beyond our border.

- b. Costa of secondaries normal; no pencil of hairs on primaries.

- a'. Sexes widely different in colour, wings not green beneath.

2. *Epicalia esite*.

Epicalia esite, R. Feld. Verh. k. k. zool.-bot. Ges. Wien. 1859, p. 472¹.

Alis nigris, anticis macula rotunda super ramos medianos sed cellulam haud intrante, altera elliptica ad apicem, fulvis; posticis macula magna discali ejusdem coloris, angulo apicali et serie punctorum submarginalium

BIOL. CENTR.-AMER., Rhopal., Vol. I., *March* 1883.

lilacino-cæruleis; subtus anticis ochraceis, fascia transversa fusca ultra cellulam; posticis fuscis ad costam ochraceiscentibus.

Femina alis obscuro fuscis litura obliqua per cellulæ finem maculisquo ad apicem flavis, posticis lineis duabus submarginalibus quoque flavis, subtus anticarum apicibus et posticis fusco-griseis, his medialiter læte rufo-brunneo ornatis.

Hab. MEXICO, Potrero (*Hedemann*¹), Cordova (*Rümeli & Höge*), Oaxaca (*Fenochio*); BRITISH HONDURAS, Rio Hondo (*Blancaneaux*); GUATEMALA, Panan, Cubilguitz, Pantaleon, Las Mercedes (*Champion*), Pacific slope (*F. D. G. & O. S.*), Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*); COSTA RICA, Cache, Irazu (*Rogers*); PANAMA, Chiriqui, Bugaba (*Champion*), Calobre (*Arcé*).—COLOMBIA.

This species is very closely allied to the Brazilian *E. penthia*, from which the male differs in having the inner of the two tawny spots of the primaries rounder in form and placed wholly outside the cell; the spot, of the same colour, near the base of the secondaries is also rather more restricted longitudinally. The females of these two species are almost identical in colour; the transverse yellow band of the primaries in Central-American examples is perhaps a little narrower. Both *E. esite* and *E. penthia* have a near ally in *E. numilia* (Cr.); and the males of the two last named are perhaps not to be distinguished from one another. The female of *E. numilia*, however, has the whole of the inner area of the secondaries brick-red, with a submarginal row of black spots outside the cell.

The closer affinity of *E. esite* to the Brazilian *E. penthia* than to the Guianan and Amazonian *E. numilia* is another of the many instances of the relationship subsisting between Central-American and Brazilian forms, of which we have already had several.

E. esite was first described by Rudolf Felder from Lieut. Hedemann's specimens captured at Potrero in Mexico¹, where it would appear, from the number of specimens sent us by Herr Höge and by Rumeli, to be not uncommon. In Guatemala it enjoys a wide range in the hotter parts of both sides of the country. It is doubtless also an inhabitant of low-lying forests throughout the rest of its range.

It is probably to this species Boisduval refers (*Lép. Guat.* p. 41) under the name *E. numilia*.

3. *Epicalia nyctimus*.

Epicalia nyctimus, Westw. Gen. Diurn. Lep. p. 257¹; Hew. Ex. Butt. *Epicalia*, t. 2. f. 5, 6²; Butl. & Druce, P. Z. S. 1874, p. 347³; Boisd. *Lép. Guat.* p. 41⁴.

Epicalia salacia, Godm. & Salv. Trans. Ent. Soc. 1880, p. 123 (nec Hew.)⁵.

Alis supra brunneo-nigris, fascia communi lata fulva ab anticarum apice ad medium marginis posticarum interni; subtus rufo marmoratis, marginibus externis fere rufo immaculatis, anticis fascia fulva sicut in pagina superiore sed apicem haud intrante.

Femina feminae *E. chromidis* supra similis sed minor, subtus fasciis paginæ superioris bene indicatis, posticis griseo et rufo marmoratis, plaga magna unicolori fusca ad angulum apicalem.

Hab. MEXICO⁴ (*Deppe*), Cordova (*Rümeli*), Oaxaca (*Fenochio*); GUATEMALA, central

valleys, San Gerónimo (*F. D. G. & O. S.*), Teleman, San Juan, Cubilguitz, Coatepeque, Zapote, El Tumbador (*Champion*), Polochic valley (*Hague*); HONDURAS⁴; NICARAGUA, Chontales (*Janson*); COSTA RICA (*Van Patten*); PANAMA, Chiriqui (*Champion*), Calobre (*Arcé*).—COLOMBIA⁵; VENEZUELA¹; ECUADOR¹.

This is the commonest species of the genus in Central America, being found from Southern Mexico through our region to the north-western portion of South America. Specimens from all parts of this wide area are remarkably uniform in their markings, and show no differences worthy of note. The South-American ally of *E. nyctimus* is *E. salacia*, Hew., a species of the upper portion of the Amazons valley; to this insect we erroneously ascribed Mr. Simons's specimens from Northern Colombia⁵.

Mr. Champion has recently sent us paired specimens of this species, satisfactorily proving that, different as the sexes are in colour, they belong to one insect.

E. nyctimus is a lowland species, not ranging above 3000 feet in Guatemala.

4. *Epicalia chromis*. (Tab. XXIV a. figg. 1, 2.)

Myscelia chromis, Doubl. & Hew. Gen. Diurn. Lep. t. 27. f. 1¹.

Epicalia pierrettii, Butl. & Druce, P. Z. S. 1874, p. 347².

Alis supra brunneo-nigris, fascia lata communi fulva a ramo anticarum discocellulari inferiore ad medium marginis posticarum interni; anticis macula ejusdem coloris elliptica ad angulum apicalem; subtus anticis ochraceis, costa late cum margine externo conjuncta nigris, maculis duabus in costa aliisque quatuor submarginalibus albidis; posticis ad basin ochraceis lineis tribus nigris transfasciatis, a cellulæ fine ad marginem externum sericeo-rufo-fuscis litura indistincta ochracea in medio notatis.

Femina alis fusco-nigris, anticis vitta discali et maculis duodecim flavis notatis, posticis fascia per cellulam (anticas intrante) flava, fascia altera maculosa margini externo parallela et linea submarginali quoque flavis notatis; subtus, anticarum apicibus et posticarum ad basin albidis, his extus sicut in mare sed serie ocellorum in medio quoque notatis.

Hab. HONDURAS (*Doubleday & Hewitson*¹); COSTA RICA (*Van Patten*²), Rio Sucio, Irazu (*Rogers*); PANAMA.—COLOMBIA.

This species is so nearly related to *E. pierrettii* that when males alone are compared no tangible difference can be traced. The females, however, present the following slight characters, which serve to distinguish the two species:—The spots on the primaries are all yellow; the innermost transverse yellow band of the secondaries is narrower in *E. chromis*; and in the apex of the primaries is a tawny-red spot not visible in the allied form.

When Doubleday named this species the relationship of the sexes in *Epicalia* were not understood, and *E. chromis* was placed in the genus *Myscelia*, the male of the allied *E. pierrettii* appearing in its proper genus *Epicalia*. We now have both sexes of each of these species, and can thus trace their true affinity. An allied species is *E. salambria*, Feld., the male of which differs on the underside of the wings.

E. chromis is not a common butterfly, being found at a considerable elevation in the forest-clad mountains of Costa Rica and Panama. We have a single female specimen

from Northern Colombia, captured by Mr. Simons near San José, in the Sierra Nevada de Santa Marta.

b'. Sexes not very different in colour, wings green beneath.

5. **Epicalia aglaura.** (Tab. XXIV. figg. 13, 14 ♂, 15 ♀.)

Epicalia aglaura, Westw. & Hew. Gen. Diurn. Lep. t. 29. f. 3¹.

Epicalia obrinus, Butl. & Druce, P. Z. S. 1874, p. 347².

Alis nigris, anticis fascia ultra cellulam lata et altera minuta subapicali cyaneis; posticis litura costali fulva; subtus virentibus, anticis fasciis paginæ superioris pallidioribus lincis transversis in cellula; posticis linea transversa obscura bisectis, punctis submarginalibus et linea submarginali notatis.

Femina mari similis, sed alis magis fusciscentibus et litura fulva carentibus.

Hab. MEXICO¹; BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Polochic valley (*Hague*), Cahabon (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²).

The only evidence we have of the occurrence of this species in Mexico is the statement, in the 'Genera of Diurnal Lepidoptera,' that the type came from that country¹. From British Honduras we have a pair, and from Guatemala several males (one of which is figured), and a female from the same country. All our Guatemalan specimens are from the Polochic valley, except one taken by Mr. Champion in the adjoining valley of the Cahabon river.

Most writers who have had occasion to refer to this species have treated it as a variety of *E. ancea* of Guiana and the valley of the Amazons; but we have seen enough specimens to convince us that the difference in the shape and position of the fulvous spot of the secondaries is quite constant, and that the species is, in fact, a very good one, restricted in its range to the low-lying forests of Central America.

It was first made known by Hewitson's figure in the 'Genera of Diurnal Lepidoptera.'

EUBAGIS.

Eubagis, Boisduval, Voy. de l'Astr. Entom. p. 70; Atlas, Lep. t. 3. f. 3 (1832); Doubleday, Gen. Diurn. Lep. p. 233.

Dynamine, Hübner, Verz. bek. Sehm. p. 41 (1816).

This genus contains upwards of thirty species, all of which belong strictly to the Neotropical Region, to the exclusion of Chili and the extreme southern parts of the South-American continent. The focus of the genus seems to be the valley of the Amazons, where Mr. Bates found no less than twenty-two species. *Eubagis*, however, is well represented in our region by twelve species, only four of which are not found elsewhere. Of the remainder, some, such as *E. postverta*, have a range as wide as the genus itself; others are more restricted, being only found outside our limits in the adjoining South-American States; others again, such as the rare *E. chryseis*, occupy in common Central America and the Amazons valley.

Eubagis seems divisible into two sections, which have almost the value of genera. The section in which the sexes are coloured alike and have a comparatively long upper discocellular nervure to the primaries, the middle discocellular merged in the lower radial, and no lower discocellular at all, besides peculiarities in the secondary sexual male organs, is that to which the name *Eubagis* strictly applies, *E. athemon* being the typical species. For the other section Hübner's name *Dynamine* may be used, the typical species being *E. postverta*. In this section the sexes are divergent in colour, the upper discocellular is short, and there is a feeble lower discocellular, besides other characters. As there is much in common between these two sections, we hesitate to separate them, and follow the usual practice of keeping them in one genus, for which, as is our custom, we prefer to use Boisduval's name *Eubagis*, so well defined by Doubleday, instead of that of Hübner.

In *Eubagis* (*E. postverta*) the subcostal of the primaries emits two branches before the end of the cell, the third branch a long way beyond it; the chord of the middle discocellular is in a line with the short upper discocellular, that of the atrophied lower discocellular, which meets the median nervure at the origin of the second branch, is at right angles to the subcostal. In *E. theseus* the upper discocellular is much longer than in *E. postverta*, the middle discocellular is merged in the lower radial, which is nearly straight from where it parts from the upper radial, and there is no trace of a lower discocellular. The front legs in the male (*E. postverta*) are slightly hairy; coxæ $> \frac{1}{2}$ femur + trochanter; tibia = femur; tarsus (single-jointed) = $\frac{2}{3}$ tibia. Eyes hairy. Antennæ with 31 joints (37 in *E. theseus*), the terminal 11 forming a moderate club. Palpi slightly hairy, terminal joint short; middle joint rather stout and long, somewhat swollen in the middle. The male secondary sexual organs have a well-developed tegumen terminating in a sharp point; the harpagones have two recurrent hooks, one near the distal end, the other on the ventral edge. In *E. theseus* these hooks are absent.

a. Sexes nearly alike; inner area of both wings white.

a'. Secondaries without ocelli beneath.

1. *Eubagis agacles*.

Papilio agacles, Dalm. Anal. Ent. p. 47¹.

Eubagis agacles, Bates, Journ. Ent. ii. p. 320².

Alis albis fusco-nigro marginatis, ciliis posticarum omnino albis, anticis macula ultra cellulam costam attingente et duabus ad marginem externum albis; subtus marginibus fuscis ochraceo variegatis et viridi lineatis, maculis albis paginæ superioris majoribus et posticis lunula angustissima ad angulum apicalem alba ornata.

Obs. *E. theseo* similis, sed statura minore et colore viridi anticarum costali absente differt.

Hab. PANAMA, Volcan de Chiriqui, Bugaba, Calobre (*Champion*).—VENEZUELA; LOWER AMAZONS²; SOUTH BRAZIL¹.

Eubagis agacles differs from all the species of this section, except *E. ate* described below, in the absence of the metallic colour towards the base of the dark costa of the primaries. From *E. ate* it can at once be recognized by the absence of the dark discoidal band of the secondaries.

We have many specimens from the neighbourhood of the Volcan of Chiriqui; these differ in no way from those collected by Mr. Bates at Para and in its vicinity; nor can they be distinguished from Pernambuco examples captured by Mr. W. A. Forbes. Others from the Brazilian province of St. Paulo are also identical.

Mr. Bates's specimens were taken about the skirts of the woods on the banks of the Amazons.

This is the smallest species of the group.

2. *Eubagis pieridoides*.

Eubagis pieridoides, Feld. Reise d. Nov. Lep. p. 410¹.

E. theseus similis, sed plerumque major, colore viridi costæ anticarum magis extenso, macula alba discali absente; subtus stria obliqua alba ad cellulæ basin, et macula apicali posticarum alba fero obsoleta distinguenda.

Hab. PANAMA, Lion Hill (*M^cLeannan*).—COLOMBIA¹; VENEZUELA.

We have a single female specimen from Panama, agreeing with others from Colombia and Venezuela, which we attribute to this species of Dr. Felder's. It is most nearly allied to *E. theseus*, differing in the white of the inner portion of the wing extending into the cell and absorbing the discal spot of *E. theseus*, which is represented by a notch. Beneath there is an oblique white streak inside the cell of the primaries, not seen in the allied species. The white lunate spot near the apical angle of the secondaries is almost obsolete.

E. pieridoides was described by Felder from Bogota specimens, which were probably taken in the hot forests of the valley of the Magdalena river. Our Venezuelan specimens were captured by Dr. Hahnel near San Esteban.

3. *Eubagis theseus*. (Tab. XXIV a. figg. 7, 8.)

Eubagis theseus, Feld. Wien. ent. Mon. v. p. 106¹.

Alis albis fusco-nigro extus marginatis, anticis puncto in cellula albo, altero extra eam majore costam attingente et duobus in margine externo albis, regione costali viridi nitente; subtus ut supra, sed punctis albis majoribus et parte fusco-ochraceo lineis viridescentibus variegata, posticis quoque lunula alba ad angulum apicalem ornatis.

Femina mari similis, sed colore viridi arcæ costalis anticarum fere obsoleto vix distinguenda.

Hab. MEXICO, Valladolid in Yucatan (*Gaumer*); GUATEMALA, San Gerónimo (*Champion*), Motagua valley, Pacific slopes (*F. D. G. & O. S.*); COSTA RICA (*Van Patten*).—COLOMBIA¹; VENEZUELA¹.

Besides one of the types of this species, formerly in Dr. Kaden's collection, we have a Colombian example named by Dr. Felder himself. These differ in no way from

Guatemalan examples, where the species is far from uncommon. At first sight *E. theseus* much resembles *E. agacles*; but, besides being larger, the males have the base of the wings suffused with greenish blue. From *E. pieridoides* it differs in having a white spot within the cell of the primaries, the white of the interior portion of the wing keeping outside the cell.

Our figure represents a specimen taken at San Gerónimo, Guatemala.

4. *Eubagis anubis*. (Tab. XXIV *a*. fig. 9.)

Eubagis anubis, Hew. Ex. Butt. Eubagis, t. 3. f. 16, 17¹; Bates, Journ. Ent. ii. p. 321².

E. theseo haud dissimilis, sed margine posticarum externo angustiore fusco et subtus posticis macula costali ferruginea, macula alba apicali nulla distinguenda.

Hab. NICARAGUA (*Belt*²).—ECUADOR; AMAZONS VALLEY^{1 2}

We only know of the existence of this species within our limits from the single Nicaraguan specimen mentioned by Mr. Bates², which is now in our possession, and which we have figured. This is a male, and differs from Hewitson's figure in the narrowness of the black border of the secondaries. The valley of the Amazons seems to be its chief habitat.

E. anubis is the largest of the Central-American species of this group, and differs from all of them in having a costal spot on the secondaries beneath.

b'. Secondaries with two ocelli beneath.

5. *Eubagis ate*, sp. n. (Tab. XXIV *a*. figg. 5, 6.)

Alis supra fere ut in *E. theseo*, sed marginibus omnibus obscuris multo latioribus fascia fusca cellulam posticarum transeunte anticarum marginem internum intrante (sicut in femina *E. athemonis*) bene separata; subtus quoque ocellis duobus in margine posticarum externo ab *E. theseo* et ab omnibus hujus sectionis speciebus distinguenda.

Hab. GUATEMALA, Telemán, Cubilguitz (*Champion*).

At first sight this species recalls some of the forms of *E. athemon*, on account of the discal stripe across the secondaries; but not only is the costa of the primaries without any metallic colour, but the secondaries beneath have two ocelli, a character that does not occur in any other member of this section.

At present we have only seen three specimens of this species, two of which were captured at Telemán, on the Polochic river, by Mr. Champion, a little above the level of the sea, one of which is figured; the other is from Cubilguitz, in the forests of Northern Vera Paz, at an elevation of about 1200 feet.

*b. Sexes different.**c'. Secondaries beneath without ocelli.***6. *Eubagis sosthenes*.** (Tab. XXIV *a.* figg. 17, 18 ♂, 19 ♀.)*Eubagis sosthenes*, Hcw. Trans. Ent. Soc. 1869, p. 34¹.

Alis supra olivaceo-viridibus, anticarum apice, margine externo et angulo anali indentato fusco-nigris, posticis angulo anali late ejusdem coloris; subtus anticis maculis sex magnis albis notatis, area angusta inter has fusca ochraceo variegata et viridi lineata; posticis sericeo-albis, lineis quinque transversis fulvis bene separatis notatis.

Femina anticarum dimidio apicali fusco maculis sex albis notato, posticis margine externo et linea submarginali fusco notatis; subtus fere ut in mare, maculis anticarum albis minoribus.

Hab. NICARAGUA, Chontales (*Belt*¹).

The nearest allies of this species are the Brazilian *E. ines* and the Colombian *E. setabis*, from both of which it differs in having the outer dark margin of the primaries reduced to a narrow border, and in the anal angle of the secondaries being broadly blackish. It differs from *E. setabis* beneath in having the ultimate and penultimate bands of the secondaries single instead of double. *E. chryseis* is also an allied species, but has the apex of the primaries broadly black. So far as we know, *E. sosthenes* is restricted in its range to Nicaragua, where it was obtained by Belt, who supplied Hewitson with the specimens he described; and from this same source the examples we now figure were obtained.

7. *Eubagis chryseis*. (Tab. XXIV *a.* figg. 15, 16.)*Eubagis chryseis*, Bates, Journ. Ent. ii. p. 322, t. 14. ff. 2, 2*a*.

E. sostheni affinis, sed anticarum apicibus late fusco-nigris, posticis margine externo angustissime fusco distinguenda; subtus quoque maculis albis anticarum minoribus diversa.

Femina adhuc ignota.

Hab. NICARAGUA, Chontales (*Belt*).—UPPER AMAZONS.

In having no ocelli on the secondaries beneath, *E. chryseis* shows its relationship to *E. sosthenes* and its allies; but the wholly black apex of the primaries at once distinguishes it from all of these. Belt is the only naturalist who met with this species in Nicaragua; his specimens differ in no way from Mr. Bates's previously unique type from St. Paulo on the Upper Amazons.

A Nicaraguan specimen is figured.

8. *Eubagis salpensa*. (Tab. XXIV *a.* figg. 13, 14.)*Eubagis salpensa*, Feld. Wien. ent. Mon. vi. p. 113¹; Butl. & Druce, P. Z. S. 1874, p. 344².*Eubagis tithia*, Butl. & Druce, P. Z. S. 1874, p. 344 (nec Hübner)³.

Alis cyaneo-viridibus, anticis dimidio distali fusco-nigro maculis albidis quinque notatis; posticis linea angusta submarginali fusca; subtus anticis ad basin et apicibus fulvis, his macula magna alba notatis, maculis alteris

sicut in pagina superiore, posticis fulvescenti-albidis lineis tribus fulvis transvittatis, ea per cellulae finem transeunto duplici.

Femina feminae *E. sostheni* similis quoad alarum paginam superiorem, sed macula magna alba ad posticarum marginem costalem; subtus posticis lineis tribus nec quinque transversis differt.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*); PANAMA, Bugaba (*Arcé*).—COLOMBIA; VENEZUELA; PERU; BOLIVIA.

A close ally of the Brazilian *E. tithia*, the chief difference consisting in the innermost of the transverse bands of the underside of the secondaries being nearly of the same width throughout, whereas in *E. tithia* it diverges considerably towards the costa. *E. tithia* shows two submarginal bands to the secondaries, one only being visible in *E. salpensa*.

This species was originally described by Dr. Felder from specimens from the Rio Negro in Northern Brazil; we now trace it through Venezuela and Colombia, and in our region as far north as Nicaragua, where Belt obtained the male example now figured.

*d*l. Two ocelli on the secondaries beneath.

9. *Eubagis thalassina*. (Tab. XXIV *a*. figg. 10, 11 ♂, 12 ♀.)

Eubagis thalassina, Boisd. Léop. Guat. p. 42¹.

Eubagis immarginata, Godm. & Salv. P. Z. S. 1877, p. 63¹.

Alis supra olivaceo nitentibus, anticis immaculatis et limbo externo haud fusco marginato, posticis margine externo fusco puncto albo interdum ad angulum analem; subtus alis ochraceo-fuscis, anticis lineis duabus (una discali, altera infra cellulam) et maculis sex albis area inter maculas viridi lineata, posticis albidis, lineis quinque ferrugineis transvittatis, area inter secundam et tertiam obscuriore, area inter quartam et quintam ferrugineo lavata et ocellis duobus (una ad angulum analem, altera ad apicem) ornata. Femina fusca, lineis duabus transversis communibus albis, anticis quoque maculis quinque notatis, posticis linea albida obscura submarginali.

Hab. NICARAGUA, Chontales (*Belt*, *Janson*²); COSTA RICA¹; PANAMA, Volcan de Chiriqui, Bugaba (*Champion*), Veraguas (*Arcé*).

This species is allied to *E. postverta*, from which it differs in the absence of all spots on the primaries above; these are of the uniform green characteristic of so many members of the genus. The females of these two species are very much alike; that of *E. thalassina* differs, however, in having the central band of the secondaries beneath rather narrower, and inclosing a less distinct whitish mark.

When describing this species under the name of *E. immarginata*, we did not recognize Boisdual's description; we are now convinced that both names refer to the same insect, to which, therefore, the title of *E. thalassina* must be applied.

Besides the single specimen sent us by Janson, we have found others in Belt's collection, a male and a female of which are figured, also from Nicaragua; we have, too, several examples from the State of Panama.

10. *Eubagis postverta*.

Papilio postverta, Cr. Pap. Ex. t. 254. ff. C, D¹.

Eubagis postverta, Bates, Journ. Ent. ii. p. 325².

Papilio mylitta, Cr. Pap. Ex. t. 253. ff. D, E³.

E. thalassinae affinis, sed anticis limbo externo (medialiter indentato) fusco et maculis duabus ejusdem coloris (una minore ad cellulæ finem, altera majore infra eam) primo visu distinguenda.

Hab. MEXICO, Oaxaca (*Deppe*, *Fenochio*), Jalapa (*Höge*), Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, San Gerónimo, Teleman (*Champion*), Yzabal, Choacus (*F. D. G. & O. S.*), Polochic valley (*Hague*); HONDURAS, San Pedro (*Whitely*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*), Cache (*Rogers*); PANAMA, Chiriqui, Bugaba, Calobre (*Arcé*).—SOUTH AMERICA from Colombia to Brazil.

This has by far the widest range of any species of the genus, as will be seen above. It is an exceedingly common insect throughout the whole of Central America, and is everywhere very constant in its markings. It is the only species of *Eubagis* we know of which has an isolated black spot between the branches of the median nervure, rendering it easy to recognize.

In Guatemala it is a denizen of the warmer parts of the country, its range in altitude not much exceeding 3000 feet.

11. *Eubagis dyonis*.

Dynamine dyonis, Hübn. Zutr. ex. Schmett. ff. 871, 872¹.

Eubagis dyonis, Butl. & Druce, P. Z. S. 1874, p. 344².

Eubagis egæa, Butl. & Druce, P. Z. S. 1874, p. 344 (nec Fabr.)³.

Alis æneo-olivaceis nitentibus ab omnibus hujus generis distinguenda, marginibus externis fuscis, anticis medialiter indentatis; subtus ocellis posticarum fascia alba a margine externo bene separatis.

Femina fascia alba communi una nec duabus a femina *E. postvertæ* distinguenda; subtus lateribus fasciæ mediæ posticarum haud parallelis.

Hab. MEXICO (*Karwinsky*¹), Jalapa (*Höge*), Valladolid in Yucatan (*Gaumer*); GUATEMALA, Polochic valley (*Hague*), Cahabon, San Gerónimo, El Reposo (*Champion*), Motagua valley, Pacific slopes (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Janson*); COSTA RICA (*Van Patten*^{2 3}), Irazu, San Francisco (*Rogers*).

This species, first described from specimens brought from Mexico by the traveller Karwinsky¹, is, we believe, peculiar to Central America; we have seen no examples of it from any place south of Costa Rica. The male can be easily recognized from its allies by the golden tint of its upper surface. The female, as pointed out below, differs from that sex of *E. glauce* in having the central cross band of the secondaries beneath divergent towards the inner margin, where it encloses a whitish triangular mark.

12. **Eubagis glauce.** (Tab. XXIV a. figg. 20, 21 ♂, 22 ♀.)

Eubagis glauce, Bates, Journ. Ent. ii. p. 324¹.

Alis olivaceis nitentibus, anticarum apicibus fuscis maculam indistinctam includentibus. *E. dyoni* affinis, colore alarum in mare haud æneo tincto distinguenda.

Femina feminae *E. dyonis* persimilis, sed subtus lateribus fasciæ mediæ posticarum parallelis dignoscenda.

Hab. GUATEMALA, Choctum, Polochic valley (*Hague*), Northern Vera Paz, central valleys (*F. D. G. & O. S.*¹); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*), Cache, San Francisco (*Rogers*). — COLOMBIA; VENEZUELA; PERU; AMAZONS VALLEY¹.

This species is most nearly allied to *E. dyonis*; but the males may be distinguished by the greener and less golden tint of the upper surface. The females, which are very much alike, differ in the central cross band of the secondaries beneath being of a nearly uniform width; in *E. dyonis* this band widens towards the inner margin, where it encloses a whitish triangular mark. In both these species the ocelli are more isolated than in *E. postverta*.

E. glauce was described by Mr. Bates from specimens from the Amazons valley, where he found it abundant in the neighbourhood of Ega. In our country it is by no means uncommon in Guatemala, and thence southward to Costa Rica; but we have no specimens from the State of Panama. We have figured Guatemalan examples—the male from the Polochic valley, the female from the forests of Northern Vera Paz.

HÆMATERA.

Hæmatera, Doubleday, Gen. Diurn. Lep. p. 231 (1849).

There appear to be three species contained in this small Neotropical genus. That first described under the name of *Papilio pyramus* occurs in the Amazons region and Colombia, and is the one we include in our fauna, two specimens being in Belt's collection from Nicaragua. A species closely allied to this, and figured as *P. pyramus* by Stoll, occurs in Brazil and Paraguay. The third species is *P. thysbe*, which is found in Northern Colombia and Venezuela. The genus is not closely allied to any other that we know of; we place it here, following Doubleday's arrangement.

In *Hæmatera* the subcostal nervure of the primaries emits its first branch just before the end of the cell, the second some way beyond it; the upper discocellular is longer than in the neighbouring genera, except *Eubagis*; the middle curves rather abruptly into the lower radial, there being no trace of a lower discocellular; the costal and median nervures are considerably swollen towards their proximal ends. The front legs of the male have the coxa $> \frac{1}{2}$ femur + trochanter; tibia $<$ femur; tarsus $<$ tibia. The eyes are smooth. The palpi are slightly hairy, the terminal joint being about $\frac{1}{3}$ the middle joint, which is stout and slightly swollen towards the distal end. The antennæ have 35 joints, the terminal 10 forming an abrupt club. The secondary male sexual organs

have a tegumen terminating in a long depressed central spine, beneath which, in the interior of the cavity of these organs, are two strong spines; the harpagones are simple lobes, hairy, but without spines; they project about to the end of the tegumen; the detached piece below the harpagones is abruptly splayed out at its distal end, which is cut square; the two angles bear two long strong hairs each.

1. *Hæmateræ pyramus*.

Papilio pyramus, Fabr. Spec. Ins. ii. p. 130¹; Drury, Ill. Nat. Hist. iii. t. 23. f. 3, 4²; Don. Nat. Rep. i. t. 3. f. 2 (nec Stoll)³.

Alis nigris, anticis medialiter, posticis plaga magna costam attingente coccineis, alis ambabus ad basin ferrugineo-rufo lavatis: subtus anticis ut supra, apicibus vero et posticis omnino fuscis griseo irroratis, his maculis quibusdam fulvis indistincte notatis.

Femina ut videtur a mare differt anticis solum nec posticis coccineo ornatis.

Hab. NICARAGUA, Chontales (*Belt*).—COLOMBIA; AMAZONS VALLEY.

Two specimens in the late Mr. Belt's collection, the only Central-American ones we have seen, agree with others from Colombia and the Amazons valley, and appear to be the species represented by Donovan³ and Drury² as *Papilio pyramus* of Fabricius¹.

Both Belt's specimens are males; but a female from Santarem in the Amazons valley, which we attribute to this species, differs from the male in having a large red spot on the primaries alone, the secondaries being uniform black. A similar sexual difference exists in the South-Brazilian *Hæmateræ*.

CYCLOGRAMMA.

Cybdelis, Sect. II. *Cyclogramma*, Doubleday, Gen. Diurn. Lep. p. 219 (1849).

Doubleday, who first suggested this name for the two species mentioned below, does not seem to have examined either of them thoroughly; for he would at once have seen that their affinities were with *Callicore* rather than with *Cybdelis*. Indeed, so close is the relationship with the former genus that we somewhat doubt the propriety of keeping them separate. In *Cyclogramma* the upper discocellular of the primaries, though short, is distinctly visible; but in *Callicore* the upper radial branches immediately from the subcostal. The tibiæ, too, of the latter genus are more dilated than in *Cyclogramma*.

Two species have hitherto been associated in this genus, both of them Central-American or Mexican. To these may probably be added the Ecuadorean *Catagramma ceryx*, Hew., which has more the appearance of a *Cyclogramma* than of the genus in which Hewitson placed it; but we have not examined this rare species critically.

In *Cyclogramma* the first subcostal branch in the primaries is emitted beyond the end of the cell, the upper discocellular is short, the middle curved into the lower radial, there being no lower discocellular. The front legs of the male are hairy; the coxa rather long= $\frac{2}{3}$ femur+trochanter; tibia > femur; tarsus (single-jointed)=femur; both tibia and tarsus slightly expanded laterally. Eyes hairy. Palpi slightly hairy, terminal

joint $< \frac{1}{2}$ middle joint, neither being dilated. Antennæ with 33 joints, the terminal 9 forming a rather abrupt club. The secondary male sexual organs have a pointed tegumen; the harpagones have a terminal lobe without spines, but inside near the base is another elongated lobe or blunt spine.

1. *Cyclogramma pandama*.

Cyclogramma pandama, Doubl. & Hew. Gen. Diurn. Lep. p. 219, t. 27. f. 5¹; Butl. & Druce, P. Z. S. 1874, p. 349².

Alis brunneo-fuscescentibus, anticarum dimidio postico obscuriore, puncto subapicali albo, stria transversa ultra cellulam a costa ad angulum analem fulva; subtus anticis plus quam dimidio basali coccineo, deinde fascia transversa nigra, apice et posticis griseo-fuscescentibus, his fascia valde sinuata transversa et duabus submarginalibus lunulatis nigris et figuras duas 8 formantibus notatis.

Femina mari similis, coloribus supra forsan pallidioribus.

Hab. MEXICO¹ (*Deppe*), Cordova (*Höge*), Oaxaca (*Fenochio*); GUATEMALA, Dueñas, Polochic valley (*F. D. G. & O. S.*), San Gerónimo, El Tumbador (*Champion*); COSTA RICA (*Van Patten*²), Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Arcé, Champion*), Bugaba (*Champion*).

One of the most familiar species in Central America, being found throughout the country from Southern Mexico to the State of Panama. We met with it at Dueñas and elsewhere in Guatemala at an elevation of about 5000 feet, which is probably nearly the extreme limit of its vertical range.

It frequents the roadside pools in company with *Callicore*, *Callidryas*, &c.

Deppe's specimens, now in the Berlin Museum, were probably the first sent to Europe; but the species was not figured until nearly twenty years afterwards, in the 'Genera of Diurnal Lepidoptera' in 1849¹.

2. *Cyclogramma bacchis*. (Tab. XXIV a. figg. 3, 4.)

Cybdelis bacchis, Doubl. Gen. Diurn. Lep. p. 219¹.

Cyclogramma bimaculata, Hew. Trans. Ent. Soc. ser. 3, v. p. 565².

Alis fuscis cyaneo tinctis, anticis macula magna discali et altera minore ad apicem albis; subtus fere sicut in *C. pandama*, sed anticis ad basin tantum coccineis et maculis albis paginæ superioris apparentibus.

Hab. MEXICO², Acatlan, Huahuapan (*Hedemann*), Tuzantla (*Bilimek*), Oaxaca (*Fenochio*).

Doubleday, in describing this species, gave its locality as Bolivia, doubtless in error, as we find our Mexican specimens agree accurately with the type. This mistake probably misled Hewitson, who redescribed this insect under the name of *C. bimaculata*². In the catalogue of his collection, however, it stands under Doubleday's name.

C. bacchis has a very restricted range in Southern Mexico, where it would appear to be by no means common. We have figured an example from our collection sent us from Oaxaca by Don A. Fenochio.

Besides the specimens in our collection and those in the British Museum, we have seen others in the Museum at Vienna obtained through Lieut. Hedemann and Herr Bilimek.

CALLICORE.

Callicore, Hübner, Verz. bek. Schm. p. 41 (1816); Doubleday, Gen. Diurn. Lep. p. 237.

Mr. Kirby in his Catalogue of Diurnal Lepidoptera includes the names of twenty-three species in this genus; but many of these were proposed by Guénée in 1872, the greater part of which have not been satisfactorily recognized by more recent workers. In our own collection we possess some twenty species, which number probably about represents the specific strength of the genus. Of these, five are found within our area, only two of which, *C. astala* and *C. eupepla*, are peculiar to it, the former being generally distributed throughout the region from Mazatlan to Panama, the latter being peculiar to Costa Rica and Panama. The metropolis of the genus seems to be the slopes of the Andes, few species being found in Guiana and Southern Brazil.

In *Callicore* the first branch of the subcostal nervure of the primaries is emitted beyond the end of the cell, the upper discocellular is absent, the middle curves into the lower radial, there being no trace of a lower discocellular. The front legs of the male are hairy; the coxa stout, $> \frac{1}{2}$ femur + trochanter; tibia swollen, $>$ femur; tarsus (single-jointed) = femur. Eyes hairy. Palpi hairy, terminal joint = $\frac{1}{3}$ middle joint, which is not swollen. Antennæ with 35 joints, the terminal 12 forming a somewhat abrupt club. The secondary male sexual organs are very like those of *Cyclogramma*: they have a pointed tegumen; the harpagones are simply lobed, and there is what appears to be an inner lobe starting from near the base of each harpagone.

a. One or more indistinct spots in the rings of the underside of the secondaries.

1. *Callicore astala*. (Tab. XXV. figg. 5, 6 ♀.)

Catagramma astala, Guér. Icon. Règne An. Ins. texte, p. 479¹.

Callicore astala, Butl. & Druce, P. Z. S. 1874, p. 344².

Callicore cornelia, H.-Sch. Samml. aussereur. Schm. ff. 21, 22³.

Alis supra nitidissime cæruleis, ciliis externis albis, anticarum apicibus nigris maculam albam includentibus, plaga sericeo-cærulea discali a cellulae fine ad angulum analem transeunte; subtus anticis dimidio antio coccineo, præter basin albam dimidio postico nigro apice albo, lineis duabus submarginalibus notatis, posticis sericeo-albis, costa et linea submarginali coccineis, hac inter lineas duas nigras posita, lineis quoque duabus transversis nigris ad basin, et extra eas duobus annulis figuram 8 habentibus, maculis duabus indistinctis inclusis.

Femina mari similis, colore cæruleo absente et macula sericeo-cærulea majore et viridescenti tincta, atomis quoque viridibus ad anticarum basin notata.

Hab. MEXICO^{1 3}, Cordova (*Rümeli*), Oaxaca (*Fenochio*); GUATEMALA, San Gerónimo, Polochic valley, Choctum (*Hague*), Senahu, San Gerónimo, Zapote (*Champion*), Yzabal, Pacific slope, Dueñas (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt*); COSTA RICA

(*Van Patten*²), Cache, San Francisco (*Rogers*); PANAMA, Volcan de Chiriqui (*Champion, Arcé*).

Callicore astala may be distinguished from all its Central-American allies by having the spots within the rings on the underside of the secondaries nearly obsolete, a character it has in common with the Colombian *C. gabaza*. It is an exceedingly common species throughout the whole of Central America. In Guatemala we found it at all elevations up to about 5000 feet. It is a curious fact that females are extremely rarely met with; we have seen many hundreds of males, but only three of the opposite sex have ever come under our observation. We can only suppose that the latter are much more retiring in their habits than the males, which are conspicuous in the crowds of butterflies that throng damp sandy places. One of these females is figured.

Callicore astala was described by Guérin-Ménéville from Mexican examples¹; and the same country supplied Herrich-Schäffer with the specimen he subsequently figured as *C. cornelia*³.

b. One or more distinct black spots in the rings of the underside of the secondaries.

a'. A white spot near the apex of the primaries.

2. *Callicore anna*.

Catagramma anna, Guér. Icon. Règne An. Ins. texte, p. 480¹.

Catagramma phytas, Boisd. Lép. Guat. p. 41².

Alis nigris, ciliis externis albis, anticis fascia transversa ultra cellulam a costa ad angulum analem viridescenti-cærulea nitente, puncto albo ad apicem, posticis fascia submarginali cretaceo-cærulea notatis; subtus fero sicut in *C. astala*, colore posticarum coccineo ad costam restricto, annulis distincte nigro bipunctatis.

Hab. MEXICO¹, Mazatlan (*Forrer*), Orizaba, Oaxaca (*Fenochio*), Jalapa (*Höge*), Cordova (*Rümeli*); BRITISH HONDURAS, Rio Hondo (*Blancaneaux*); GUATEMALA, Dueñas (*F. D. G. & O. S.*), Chisoy valley, Choctum, San Gerónimo, Polochic valley (*Hague*), Las Nubes (*Salvin*); COSTA RICA, Cache (*Rogers*).

This species at first sight is not unlike *C. astala*, having a white spot near the apex of the primaries as in that insect; but it wants the dark blue sheen of *C. astala*, and it has a submarginal blue band to the secondaries; the spots also in the rings of those wings beneath are clearly defined.

Like *C. astala* it has a very extended range, the two species being often found in close proximity.

We have not yet met with the female of this common species.

Like the preceding, *C. anna* was described by Guérin-Ménéville from Mexican specimens, whence we have received several specimens. Boisduval's name, *C. phytas*, seems undoubtedly to belong to the same species. We know of no other common Guatemalan *Callicore* to which his description is at all applicable.

3. *Callicore eupepla*. (Tab. XXV. figg. 3, 4.)

Callicore eupepla, Godm. & Salv. Ann. & Mag. Nat. Hist. ser. 4, ii. p. 146¹; Butl. & Druce, P. Z. S. 1874, p. 344².

Alis nitidissime cæruleis, certe luce ambabus viridescente nitentibus, anticis puncto apicali albo, posticis litura subapicali cretaceo-cærulea; subtus fere omnino ut in *C. anna* colore coccineo anticarum magis restricto. Femina adhuc ignota.

Hab. COSTA RICA (*Carmirol*¹, *Van Patten*²), Cache (*Rogers*); PANAMA, Chiriqui (*Arcé*), Volcan de Chiriqui and Bugaba (*Champion*).

One of the most beautiful species of the genus, being allied to *C. phlogæa* of Colombia and *C. metiscus* of Venezuela, all of them insects with a brilliant greenish-blue gloss on the wings, which varies according to the angle at which the light falls upon them.

C. eupepla was first described from specimens from Costa Rica, where we have since ascertained it is by no means uncommon; it is equally abundant in the neighbourhood of the Volcan de Chiriqui.

b. No white spot near the apex of the primaries.

4. *Callicore marchalii*.

Catagramma marchalii, Guér. Ieon. Règne An. Ins. texte, p. 481¹.

Callicore eucleides, Butl. & Druce, P. Z. S. 1874, p. 344².

Alis nigris, anticis fascia viridi-cærulea ultra cellulam a vena subcostali ad angulum analem transeunte, posticis litura angusta (nonnunquam absente) submarginali cretaceo-cærulea; subtus sicut in *C. anna*, colore sericeo-albo verum fumoso-brunneo suffuso.

Femina mari similis, at fascia anticarum paulo latiore.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²), Cache (*Rogers*); PANAMA, Chiriqui, Veraguas (*Arcé*), Bugaba (*Champion*), Lion Hill (*M. Leannan*).—COLOMBIA¹; VENEZUELA; ECUADOR.

Distinguished from its allies by having the ground-colour of its posterior wings beneath of a smoky brown instead of white. In this respect it resembles the Colombian *C. gabaza*, which, however, has the spots within the rings on the secondaries obsolete, those in *C. marchalii* being clearly defined.

Nicaragua is, so far as we know, the most northern point reached by this species; but in Costa Rica and in the State of Panama, as well as in Colombia, it appears to be very abundant.

We have one female of this species from Nicaragua, the only one we have yet seen.

C. marchalii was described by Guérin-Ménéville from Colombian examples.

5. *Callicore neglecta*. (Tab. XXV. figg. 1, 2.)

Callicore neglecta, Salvin, Ann. & Mag. Nat. Hist. ser. 4, iv. p. 176¹.

Alis nigris, fascia anticarum et litura posticarum submarginali nitenti-cæruleis, hac litura altera angusta cretaceo-cæruleo marginata; subtus fere omnino ut in *C. anna*.

Femina adhuc ignota.

Hab. GUATEMALA, Central valleys (*F. D. G. & O. S.*¹).—ECUADOR; PERU; BOLIVIA.

Though of wide range in South America, a single specimen from Guatemala is the only one we have received from Central America. It is most nearly allied to *C. clymena*, but, besides having the markings of the underside less deeply impressed, there is a second submarginal blue band on the secondaries, not seen in any other species of the genus. The inner and wider of the two blue bands of the secondaries is shining blue, like the band of the primaries; this is not so in *C. clymena*, showing that the narrow external dull band in *C. neglecta* is the homologue of the wider band of *C. clymena*.

CATAGRAMMA.

Catagramma, Boisduval, Sp. Gén. i. t. 9. f. 2 (1836); Doubl. Gen. Diurn. Lep. p. 243.

The genus *Catagramma* is a purely Neotropical one, containing about forty species, which are distributed throughout Tropical America to the exclusion of the West-Indian Islands. The greatest number of species are to be found in the Amazons valley and the eastern slopes of the Andes of Ecuador and Peru. In Central America and Mexico we find twelve species, only four of which reach Southern Mexico, where all are rare, and two of them peculiar to the country, being represented at present by single specimens. Guatemala has six species, Nicaragua, Costa Rica, and Panama eight. Of the whole twelve, eight species are peculiar to our country, the other four spreading into the adjoining parts of Colombia and some into Ecuador.

Catagramma may easily be distinguished from *Callicore* by its smooth eyes and by the subcostal nervure of the primaries throwing off its first branch before the end of the cell. The front legs, too, of the male have the tibia and tarsus more dilated at the end.

As already stated, the subcostal nervure of the primaries in *Catagramma* (*C. pitheas*) emits the first branch before the end of the cell, the second some way beyond it; the upper discocellular is very short; the middle discocellular curves abruptly to join the lower radial, there being no trace of a lower discocellular. The front legs of the male are hairy, the coxa slightly $> \frac{1}{2}$ femur+trochanter; femur slender; tibia $<$ femur, slender at its proximal end, but considerably dilated towards its distal end; tarsus (single-jointed) rather $> \frac{1}{2}$ tibia, swollen and rounded at its distal end. The eyes are smooth. Antennæ with 39 joints, of which the terminal 13 form a rather abrupt club. Palpi with terminal joint short, being $< \frac{1}{3}$ the middle joint, which is slender and of nearly uniform thickness throughout. The male secondary sexual organs have a tegumen with a long central spine, below which in the cavity of these organs are two strong spines curved abruptly downwards and outwards; the harpagones are feeble, simple, slightly upturned lobes, projecting to the point of the tegumen and slightly hairy on the ventral and lateral surfaces.

a. Primaries crossed with a tawny or red band, base black or blue.

a'. Spots of secondaries beneath arranged in a line.

1. *Catagramma atacama*.

Catagramma atacama, Hew. Ex. Butt. *Catagramma*, t. 1. f. 1, 2¹; Butl. & Druce, P. Z. S. 1874, p. 343².

Alis nigris, anticis fascia obliqua ultra cellulam fulva, anticearum basi et area interna posticarum distali viridescenti-cyaneis; subtus anticis fere ut supra, costa ad basin, linea longitudinali in cellula et fascia transversa apicali flavis notatis, maculis quoque tribus cyaneis in apice ipso, posticis fasciis sex flavis transfasciatis, prima basali marginem internum attingente, quarta ad angulum analem maculis duabus cyaneis terminata, area nigra inter quintam et sextam ad angulum analem lunulis quibusdam cyaneis notata.

Hab. COSTA RICA (*Van Patten*²); PANAMA, Volcan de Chiriqui (*Champion*), Veraguas (*Arcé*).—COLOMBIA¹.

Hewitson described this species from specimens said to have come from Quito, but all our South-American examples have been obtained in the more northern State of Colombia. Within our limits it is by no means an uncommon species in collections made in the vicinity of Chiriqui; and a single specimen was in Van Patten's Costa-Rican series.

The markings of this insect are very constant; but one individual from Colombia has the tawny band which lies in the same line as the two blue spots of the secondaries beneath broken up into a series of spots. In this respect it resembles *C. faustina*; but in that species all the spots in this band are blue instead of being tawny.

2. *Catagramma faustina*. (Tab. XXV. figg. 7, 8.)

Catagramma faustina, Bates, Ent. Monthl. Mag. iii. p. 134¹; Butl. & Druce, P. Z. S. 1874, p. 343².

C. atacamæ similis, sed subtus linea transversa posticarum quarta omnino macularum cyanearum composita distinguenda.

Hab. COSTA RICA (*Van Patten*²); PANAMA, Lion Hill (*M'Leannan*¹).

C. faustina was described from a single specimen sent us by M'Leannan from the Isthmus of Panama. The only other example we have met with is that included by Messrs. Butler and Druce in their list of Van Patten's Costa-Rican collection.

As already stated, this species is closely allied to *C. atacama*, but may at once be distinguished by the row of blue spots which crosses the secondaries beneath. This in the allied species for the greater part of its length is replaced by a continuous tawny band, which, again, in rare instances is broken up into tawny spots.

Our figure is taken from the Panama insect, the type of Mr. Bates's description.

b'. Spots of secondaries beneath not in a line, but enclosed in a single ring.

3. *Catagramma lyca*.

Catagramma lyca, Doubl. & Hew. Gen. Diurn. Lep. t. 28. f. 4¹; Hew. Ex. Butt. *Catagramma*, t. 5. f. 38, 39².

C. atacamæ similis, quoad colorem alarum paginæ superioris; subtus anticis fascia discali ad basin nulla, posticis lineis tribus flavis transfasciatis, area inter secundam et tertiam maculis cæruleis septem irregulariter positis notata, fascia quoque cærulea submarginali ornatis.

Hab. MEXICO^{1 2}; GUATEMALA, Choctum (*Hague*).

A rare species, at present only known from Mexico and Guatemala; and from the latter country a single specimen alone has reached us. It was first described and figured in the 'Genera of Diurnal Lepidoptera' under a manuscript name of Boisduval's, and again figured by Hewitson in his 'Exotic Butterflies.'

It may be distinguished from its allies in having the tawny band of the primaries as well as those of the secondaries beneath very narrow. The blue submarginal band of the secondaries extends right round to the apical angle. In the only other allied Central-American species this band for half its length is tawny, and the blue of the secondaries above is of a much brighter hue.

In South America three other allied species occur, the nearest being *C. salamis* of Felder; but this differs both from *C. lyca* and *C. ærias* (next described) in having the tawny band of the primaries beneath approaching almost to the base of the wing; *C. mionina* of Hewitson is also an allied form with a large elliptical tawny spot in the primaries. *C. ægina* of Felder is again another nearly related species, in which the tawny band of the primaries occupies more of the costa and approaches the base of the wing.

4. *Catagramma ærias*, sp. n.

Catagramma lyca, Butl. & Druce, P. Z. S. 1874, p. 343¹ (nec Doubleday).

C. lyræ similis, sed plaga cyanea posticarum viridescentiore, subtus linea posticarum submarginali haud omnino cyanea sed dimidio apicali flavo distinguenda.

Hab. NICARAGUA, Chontales (*Belt, Janson*), Graytown (*Muncaster*); COSTA RICA (*Van Patten*¹); PANAMA, Volcan de Chiriqui (*Champion*), Veraguas (*Arcé*), Lion Hill (*M'Leannan*).

It seems desirable to separate this Central-American form from its South-American allies, seeing that the differences observable, though small, are very constant. It comes nearest to *C. salamis*, having the tawny band of the primaries above of nearly the same width. Beneath, however, this band does not approach the base of the wing as in that form. From *C. lyca* it differs in the greater brilliancy of the blue of the secondaries, and in having the apical half of the submarginal band of those wings beneath tawny.

C. ærias is by no means scarce in the State of Panama, and thence northward to Nicaragua. A Costa-Rican specimen obtained by Van Patten was called *C. lyca* by Messrs. Butler and Druce; but it undoubtedly belongs to the present species.

c'. Spots of secondaries beneath enclosed in two rings.

5. *Catagramma tolima*. (Tab. XXV. fig. 19.)

Catagramma tolima, Hew. Ex. Butt. Catagramma, t. i. f. 7, 8¹; Feld. Wien. ent. Mon. vi. p. 114.

Alis nigris, anticis fascia lata fulva bisectis, area posticarum anali chalybeo-cyanea; subtus fascia flava latiore, altera minuta ad angulum apicalem, linea submarginali cærulea, posticis punctis cyaneis duplicibus flavo (figuram 8 formante) annulatis, fasciis duabus ejusdem coloris ad basin macula fulva ad costam conjunctis; fascia submarginali cyanea a costæ medio ad alæ basin, ad apicem extra eam linea submarginali flava ornatis.

Hab. GUATEMALA, central valleys (*F. D. G. & O. S.*).—ECUADOR¹.

Hewitson's types of this species came from Ecuador, whence we have several specimens. Our only record of it in Central America is derived from a single example taken by ourselves in the interior of Guatemala. It can at once be distinguished from *C. denina* by the absence of a tawny band intervening between the ring which encloses the spots and the blue submarginal band. Like *C. denina* it has a reddish costal spot on the secondaries, a character which is absent in *C. pacifica*.

6. *Catagramma denina*. (*Catagramma guatemalena*, Tab. XXV. figg. 17, 18.)

Catagramma denina, Hew. Ex. Butt. Catagramma, t. 8. f. 60, 61¹.

Catagramma guatemalena, Bates, Ent. Monthl. Mag. iii. p. 134².

C. tolimæ similis, sed subtus posticis fascia altera flava inter annulum maculas circumcingentem et fasciam submarginalem cyaneam ornatis, fascia illa cum fascia flava secunda conjuncta.

Hab. GUATEMALA, Polochic valley², Choctum and San Gerónimo (*Hague*), Panima (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); PANAMA, Lion Hill (*M^cLeannan*).—COLOMBIA¹; ECUADOR.

This species occurs with hardly a break from Ecuador to Guatemala; but we have not yet seen specimens from Costa Rica. The Guatemalan insect was described by Mr. Bates under the name of *C. guatemalena*, and was compared by him with *C. tolima*, from which it is no doubt perfectly distinct. We are unable to trace any tangible difference between Guatemalan and Colombian examples which should bear Hewitson's name *C. denina*; all therefore should pass under this name, being the oldest. The only difference worthy of note is that the spots of the secondaries beneath are not divided by the yellow band in *C. guatemalena*. This character, however, fails in certain instances.

In Guatemala this species is found only on the eastern side of the country up to an elevation of about 4000 feet; in Nicaragua and Panama it is found at a much lower level. It is a curious fact that all our Panama specimens, five in number, are females; elsewhere the males are much more numerous than the other sex.

7. **Catagramma pacifica.** (Tab. XXV. figg. 15, 16.)

Catagramma pacifica, Bates, Ent. Monthl. Mag. iii. p. 135¹; Butl. & Druce, P. Z. S. 1874, p. 343².

Catagramma bugaba, Staud. Verh. k. k. zool.-bot. Ges. Wien, xxv. p. 103³.

C. denina et *C. tolimæ* similis, sed subtus macula posticarum fulva ad costam absente primo visu distinguenda.

Hab. GUATEMALA, Pacific slopes (*F. D. G. & O. S.*¹), Rio Naranjo (*Champion*); COSTA RICA (*Van Patten*²); PANAMA, Volcan de Chiriqui (*Ribbe*³, *Arcé*, *Champion*), Bugaba (*Arcé*, *Champion*); Calobre (*Arcé*).

This insect is found only on the Pacific side in Guatemala, whence the specimens first described by Mr. Bates were derived; it is, however, much more common in the neighbourhood of Chiriqui, where all collectors who have visited that region have met with it in abundance. Specimens from this latter locality were described by Dr. Staudinger as *C. bugaba*; but there can be no doubt as to the identity of the two insects. *C. pacifica* can be readily distinguished from *C. denina* and *C. tolima* by the absence of the quadrate reddish-orange spot near to the base of the costa of the secondaries beneath.

b. Primaries red at the base either above or beneath.

8. **Catagramma titania.** (Tab. XXV. figg. 12 ♂, 13, 14 ♀.)

Catagramma titania, Salv. Ann. & Mag. N. H. ser. 4, iv. p. 177¹; Butl. & Druce, P. Z. S. 1874, p. 343².

Alis nigris, cyaneo suffusis, anticis dimido basali coccineo, fascia indistincta subapicali rufa; subtus anticis fere ut supra fascia subapicali flava et maculis apicalibus cyaneis notatis, posticis punctis duplicibus cyaneis flavo indistincte circumcinctis, fasciis duabus ad basin et altera submarginali ejusdem coloris, inter has fascia cyanea parallela.

Hab. MEXICO, Jalapa (*Deppe*); GUATEMALA, central valleys, Polochic valley, Pacific slope (*F. D. G. & O. S.*), Choctum (*Hague*), Tocoy (*Champion*); NICARAGUA, Chontales (*Janson*); COSTA RICA (*Van Patten*); PANAMA, Veraguas (*Arcé*).

A common species throughout Central America, and especially so in Guatemala, where it occurs in the lowlands bordering the two oceans. Its nearest ally is *C. maimuna*, which is found in Ecuador and the Upper Amazons; but the red of the primaries in the northern species is more restricted, the dark parts of both wings are glossed with blue, the anal angle of the secondaries is more produced, the patch of blue more widely diffused, and on the underside the yellow lines are constantly narrower.

As a rule, this species is fairly constant in its markings; but we have a male specimen from the Pacific side of Guatemala which is altogether devoid of the blue tint of the upper surface.

9. *Catagramma patelina*.

Catagramma patelina, Hew. Ex. Butt. *Catagramma*, t. 2. f. 13, 14¹; Butl. & Druce, P. Z. S. 1874, p. 343.

C. titania similis, sed alis magis rotundatis, colore coccineo anticarum saturatiore et magis restricto, subtus posticis maculis tribus annulo flavo inclusis et fascia flava separatis, fascia quoque cærulea submarginali maculosa distinguenda.

♀ mari similis, sed major et alis magis rotundatis, posticis ad basin brunneo lavatis.

Hab. GUATEMALA¹, San Miguel, Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*, *Janson*); COSTA RICA (*Van Patten*).

C. patelina was described by Hewitson from a specimen from Guatemala, where, however, it must be extremely rare, for out of the many thousands of butterflies from that country examined by us we have only been able to detect a single male example. In Nicaragua it would appear to be rather more abundant, judging by the number of specimens sent by Mr. Belt. From Costa Rica we have only one example.

This species differs from *C. titania* in having the red of the primaries more restricted, and the markings of the underside more clearly defined. Instead of two pairs of spots on the secondaries, there is only one, next the costa; the ring enclosing these spots is complete; and the submarginal blue band is broken up into spots.

10. *Catagramma rutila*.

♀ feminae *C. patelinae* affinis, sed colore anticarum coccineo multo magis extenso, posticis ad basin distincte rufo-brunneis.

Hab. MEXICO (*Boucard*).

Of this species we have a single specimen, formerly in the collection of Mr. Druce, who obtained it from M. Boucard, with the locality "Mexique" attached to it. It evidently represents a Mexican species allied to *C. patelina*; but the much greater extension of the red of the primaries precludes it from being placed with that species.

The male, which is at present unknown to us, from the analogous case of *C. titania* doubtless resembles the female in the extent of the red of the primaries, and the dark parts will probably show a blue reflection.

11. *Catagramma casta*. (Tab. XXV. figg. 9, 10.)

Catagramma casta, Salv. Ann. & Mag. N. H. ser. 4, iv. p. 178¹.

Alis nigris cyaneo suffusis, anticis macula subapicali flava venis divisa; subtus anticis ad basin coccineis macula flava paginae superioris majore et extra eam linea submarginali cyanea; subtus lineis et maculis sicut in *C. patelina* positus, sed omnibus multo tenuioribus et minoribus.

Hab. MEXICO, Oaxaca (*Fenochio*¹).

A single male specimen sent us by Mr. Fenochio, which formed the type of our description, is the only one we have yet seen of this beautiful species. It was obtained

on the eastern slope of the mountains of Oaxaca in Southern Mexico, at an elevation of about 3000 feet above the level of the sea.

12. *Catagramma pitheas*.

Erycina pitheas, Latr. in Humb. & Bonpl. Obs. Zool. ii. p. 90, t. 37. f. 5, 6¹.

Alis nigris, anticis fascia subapicali et altera communi a basi costæ ultra posticarum cellulam extendente coccineis; subtus anticis sicut supra fascia subapicali flava et altera ultra eam angustissima cyanea, posticis rosaceo-flavis, maculis duabus nigris (una cyaneo pupillata ad medium costæ, altera interdum bipupillata angulum analem versus), extra has annulo nigro incompleto costam haud occupante, parte submarginali linea cyanea notata, parte marginem internum attingente linea flava picta.

♀ mari similis, sed major et colore coccineo dilutiore distinguenda.

Hab. NICARAGUA, San Juan del Sur (*Salvin*), San Miguelito (*Janson*), Chontales (*Belt*); PANAMA, Calobre, Bugaba (*Arcé*), David (*Champion*), Lion Hill (*M^r Leannan*).—COLOMBIA¹; VENEZUELA; PERU; LOWER AMAZONS.

There are two forms of this insect which seem always associated together in the same locality. In one, the marks of the secondaries beneath are narrow and the spot nearer the anal angle has a single light centre; on the upperside the red of the secondaries is less produced: this is the true *C. pitheas* of Latreille. In the other form the dark marks of the secondaries beneath are wider, the anal spot contains two light marks, and the red of the secondaries above extends further toward the outer margin. Both these forms occur in Central America.

Though not yet met with in Costa Rica, *C. pitheas* is not uncommon in Nicaragua, where it was taken by both Belt and Janson. Salvin also captured some specimens in the month of April 1873, in the scrubby forest in the outskirts of the seaport of San Juan del Sur.

In the State of Panama it is not uncommon; but in Northern Colombia it occurs in abundance, and thence southward to Peru.

CALLIZONA.

Callizona, Doubleday, Gen. Diurn. Lep. p. 246 (1850).

As Doubleday remarks, the single species composing this genus seems somewhat out of place in the position he has assigned to it, and where subsequent writers have been content to leave it. As will be noticed below, there are characters in the secondary male sexual organs which suggest an affinity between *Callizona* and *Melitæa*. Godart placed *C. acesta* in the genus *Argyannis*, which allocation Doubleday admitted to be not without justification. Our observations, therefore, tend somewhat to confirm this view. On the other hand the pupa, according to Stoll, has appendages like those of *Ageronia*, a fact of undoubted weight.

In *Callizona* the subcostal nervure of the primaries emits two branches before the

end of the cell, the second close to the origin of the short upper discocellular; the middle discocellular is slightly curved, its chord standing at right angles to the lower radial; a nerve-rudiment represents the lower discocellular. The front legs of the male have a stout coxa, $> \frac{1}{2}$ femur + trochanter; tibia = femur; tarsus (single-jointed) = coxa, the femur, tibia, and tarsus are all very slender. The eyes are smooth. Antennæ with 39 joints, the terminal 9 forming a slender club. The palpi have a very short terminal joint, about $= \frac{1}{5}$ the middle joint in the male, $= \frac{1}{4}$ in the female; the middle joint is slender and of nearly uniform width throughout. The male secondary sexual organs have a very short tegumen, blunt and without central spine; the harpagones have a blunt terminal spine; below is a short recurved hook; in addition to these there is a strong outwardly curved spine nearly in the middle of the inner surface of harpagones. In structure these parts are unlike what we find in the genera usually associated with *Callizona*, and greatly resemble those of *Melitæa cinxia*.

2. *Callizona acesta*.

Papilio acesta, Linn. Mus. Ulr. p. 298¹; Clerck, Ic. Ins. t. 43. f. 3².

Callizona aceste, Bates, Journ. Ent. ii. p. 212³.

Trigidia acesta, Aurivill. K. Svensk. Vet.-Ak. Handl. xix. no. 5. p. 98⁴.

Alis fulvis, maculis paginæ inferioris perlucetibus, anticis dimidio distali nigro fasciam obliquam flavam et alteram maculosam apicalem includente; subtus anticis ut supra, basi vittis nigris notatis et ad apicem maculis albidis ornatis, posticis pallide rosaceo-fuscis, lineis transversis et maculis variegatis, illis ad basin et marginem internum attingentibus crebrioribus, lineis minutis submarginalibus et inter eas linea fulva angulum analem attingente.

Hab. NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*), Irazu (*Rogers*); PANAMA, Bugaba, Chiriqui (*Champion*), Lion Hill (*M. Leannan*).—SOUTH AMERICA to the Amazons valley and North Brazil.

There is but one species of this genus spread over this wide area, which, though subject to some variation, does not admit of subdivision. The chief point of variation is in the amount of black in the distal portion of the primaries: in most cases it extends towards the base so as to isolate a tawny cross band from the rest of the wing; in others it is reduced so that the tawny band becomes united with the basal portion of the same colour. The width of this tawny band varies, and also its colour, being much paler in some individuals than in others.

Mr. Bates tells us that it is a common insect in the Amazonian forest. It is always found about the trunks of trees, settling frequently on the bark with its wings held in a perpendicular position.

Callizona acesta was known to Linnæus from specimens in the Museum Ulricæ, which form the subject of Clerck's figure. Doctor Aurivilius, in his recent paper upon these Linnean types, has given a careful summary of the references to this species by early writers.

GYNÆCIA.

Gynæcia, Doubleday, Gen. Diurn. Lep. p. 248 (1850) (ex Boisduval MS.).

A single species of wide range throughout Tropical America constitutes this genus. In some respects this insect has a general appearance not unlike that of *Callizona*; but the resemblance is superficial, though the habits of the two coincide in that they settle on trees in the same way with the wings perpendicular.

The subcostal nervure of the primaries in *Gynæcia* emits two branches before the end of the cell; the upper discocellular is very short, the middle nearly straight but slightly curved where it meets the lower radial. There is a rudimentary lower discocellular which meets the median nervure a little beyond the origin of the first branch. The front legs of the male have a stout coxa a little $> \frac{1}{2}$ femur + trochanter; tibia slightly swollen towards its distal end = femur; tarsus single-jointed = $\frac{2}{3}$ tibia*.

Eyes smooth. Antennæ with 40 to 42 joints, whereof the terminal 10 form a rather abrupt club. Palpi slightly hairy, terminal joint $> \frac{1}{3}$ middle joint, which is slender and of nearly uniform width. The male secondary sexual organs have a pointed tegumen; the harpagones are broad lobes, hairy at the extremity and on the ventral surface; there is a decurved dentate process at the distal end and a curved hook on the inner surface of each harpago. The penis is not straight, but is curved upwards in the middle.

In the structure of these parts *Gynæcia* differs widely from *Callizona*.

1. *Gynæcia dirce*.

Papilio dirce, Linn. Mus. Ulr. p. 287¹.

Gynæcia dirce, Doubl. & Hew. Gen. Diurn. Lep. p. 250, t. 29. f. 1²; Bates, Journ. Ent. ii. p. 212³.

Colobura dirce, Aurivill. Kong. Sv. Vet.-Ak. Handl. xix. no. 5, p. 90⁴.

Papilio bates, Clerck, Ic. Ins. t. 36. f. 3⁵.

Alis fuscis, posticis subcaudatis, anticis fascia obliqua flava bisectis; subtus fascia anticarum paginæ superioris obvia, alarum reliquo pallide lilacino-flavo lincis variis undique ornato, posticis ocellis submarginalibus ab angulo apicali decrescentibus; duabus quoque in angulo anali producto positis.

Hab. MEXICO, Cordova (*Rümeli*); GUATEMALA, Las Mercedes, San Isidro (*Champion*), Polochic valley (*Hague*), Chuacus, Pacific slopes (*F. D. G. & O. S.*); HONDURAS²; NICARAGUA, Chontales (*Belt, Janson*); PANAMA, Calobre (*Arcé*), Lion Hill (*M^cLeannan*). —ANTILLES², Cuba, Haiti; SOUTH AMERICA generally to Brazil.

A wide-ranging species, extending over the whole of Tropical America, including some of the West-Indian islands. Except that the underside of specimens from the latter

* In one of the specimens dissected the tarsus of one side, but not of the other, has five strong spurs at equal intervals near its distal end. These may indicate the tarsal joints, which in other respects have become fused and the sutures entirely obliterated.

region are darker, it is remarkably constant in its characters. In Guatemala it is found in the lowlying portions of the country and up to an elevation of about 3000 feet.

Mr. Bates met with it in the same situations as *Callizona acesta*, settling on the trunks of trees in the same way; but though it has considerable resemblance on the underside to that insect, not only does it differ in the shape of the wings, but also in many other important points of structure, as we have indicated above.

ECTIMA.

Ectima, Doubleday, Gen. Diurn. Lep. p. 227 (1849).

This genus contains four or five species, some of which are not very clearly defined. These range over the whole of Tropical America from Southern Brazil to Nicaragua, no species, however, being found as yet in the West-Indian islands.

The species all bear a strong resemblance to one another, being mottled above, somewhat as in *Ageronia*, and with a distinct bar across the primaries. Like the *Ageroniæ* the species of *Ectima* settle on tree-trunks and lie with the wings expanded.

The subcostal nervure in *Ectima* emits the first branch before the end of the cell, the second some way beyond it; the upper discocellular is very short, the middle much curved, and the lower an atrophied nervule reaching the median just beyond the origin of the second branch. The front legs of the male have a stout coxa $> \frac{1}{2}$ femur + trochanter; the femur, tibia, and tarsus are all slender, the tibia slightly $>$ tibia, tarsus $> \frac{1}{2}$ tibia; the tarsus has two joints. Eyes smooth. Palpi slightly hairy; terminal joint = $\frac{1}{3}$ middle joint, which is slender and of uniform width throughout. Antennæ with 34 joints, of which twelve form a rather abrupt club. The male secondary sexual organs have a tegumen with a slightly depressed hook, below which is a projection pointing outwards in the middle of the anal cavity; the harpagones are simple narrow lobes, hairy at their extremity and along the ventral edge. On the ventral surface and independent of the harpagones and tegumen is a long chitinous rod forked at its distal end and reaching almost to the end of the harpagones. This rod is not an extension of the penultimate segment, but extends as a rod into the abdomen, reaching beyond the withdrawn penis. The latter is straight and not curved as in *Gynæcia*.

1. *Ectima rectifascia*.

Ectima rectifascia, Butl. & Druce, P. Z. S. 1874, p. 345¹.

Ectima liria, Butl. & Druce, P. Z. S. 1874, p. 344 (nec Fabr.)².

Alis fuscis, anticis fascia ultra cellulam (marginem interno haud indentato) albida transvittatis, macula subapicali nigra punctis tribus albis notata, anticarum basi et posticis omnino lineis transversis nigricante fuscis notatis, posticis ocellis submarginalibus cæcis notatis; subtus anticis ut supra parte basali et apice sordide cinereis, posticis ejusdem coloris maculis et lineis ferrugineo-fuscis notatis.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*^{1 2}); PANAMA, Buguba (*Arcé*), Volean de Chiriqui (*Champion*).

Central-American specimens of this *Ectima* are very constant as regards the light-

coloured cross band of its primaries, which from the straightness of its margins suggested the name given it by Messrs. Butler and Druce¹; but we fail to find any example in Dr. Van Patten's collection at all answering to *E. liria*, a name which is also included in their list².

Mr. Bates, who found allied species throughout the Amazons region, observed them in company with *Gynæcia dirce*, all settling on the trunks of trees, but the *Ectima* lying with its wings flat, in the manner of the *Ageronia*.

We never met with *Ectima* ourselves, as the most northern point of its range is Nicaragua, where Belt obtained it. In the neighbourhood of Chiriqui it appears to be abundant, judging from the number of specimens Mr. Champion has forwarded to us.

AGERONIA.

Ageronia, Hübner, Verz. bek. Schm. p. 41 (1816), partim.

The species usually placed in *Ageronia* naturally group themselves into two sections, each of which presents sufficient characters to justify its being considered a genus. These differences are pointed out below.

The name *Ageronia* was applied by Hübner to four species, all belonging to the genus as hitherto understood. Three of these, however, go with *A. arethusa* into Boisduval's genus *Peridromia*; the fourth, *Ageronia chloe*, therefore, we retain as the type of *Ageronia*. With this species we place five or six others, all having the essential characters of *Ageronia*. In Central America we find four species of *Ageronia* as thus restricted, one being the widely spread *A. ferentina*, which ranges from Mexico and some of the Antilles to the Argentine Republic; of the rest, *A. glauconome* is found from Southern Mexico to Nicaragua, *A. atlantis* is common to Mexico and Guatemala but nowhere abundant, and *A. lelaps* has hitherto only occurred in the Mexican State of Durango.

The peculiar habits of the *Ageroniæ* have been frequently described, how they settle on the trunks of trees with the wings expanded and the head down, and how when pursuing one another they produce a sharp cracking noise apparently with the wings; but this point has never yet been satisfactorily determined.

The subcostal of the primaries (*A. atlantis*) emits two branches before the end of the cell; the upper discocellular is very short, the middle convex, and the lower also slightly convex in a simple curve and meeting the median nervure at the origin of the second branch. The front legs of the male have a rather stout coxa about $\frac{2}{3}$ femur + trochanter; tibia = femur; tarsus with sutures of joints sometimes visible = tibia. Eyes smooth. Antennæ with 48 joints, whereof 9 form a moderate club. Palpi slightly hairy; terminal joint short, about $\frac{1}{3}$ the middle joint, which is of nearly uniform width throughout. The male secondary sexual organs have a pointed tegumen, beneath which in the anal cavity is a strong spine directed outwards; the harpagones are

simple pointed lobes without spines, but hairy towards the end. There are also two rods attached to the upper edges of the ventral portion of the terminal segment of the abdomen.

- a.* Two submarginal ocelli in the anal angle of the secondaries beneath, composed of a black ring and a tawny lunule outside a black one embracing the upperside of a white spot.

1. *Ageronia ferentina*.

Nymphalis ferentina, Godt. Enc. Méth. ix. p. 428¹.

Ageronia ferentina, Bates, Journ. Ent. ii. p. 312².

Papilio feronia, Cr. Pap. Ex. t. 362. A, B (nec Linn.)³.

Alis griseis fusco et olivacco variegatis; posticis ocellis submarginalibus ornatis, ocello singulo, annulo nigro lunulis duabus, una exteriori ferruginea altera interiori nigra circumcingente et medialiter macula nigra pupillata; subtus cinereis, anticis parte distali fusco variegatis, posticis linea valde irregulari ultra cellulam et ocellis quinque submarginalibus notatis, horum secunda a costa et duabus angulo anali proximis lunulis ferrugineis et nigris notatis.

Hab. MEXICO, Acapulco (*Markham*), Oaxaca (*Fenochio*), Cordova (*Rümeli*), Valladolid in Yucatan (*Gaumer*); GUATEMALA, Yzabal, Chuacus, Central valleys, Pacific slope (*F. D. G. & O. S.*), Polochic valley (*Hague*), Chiacam, Panima (*Champion*); HONDURAS, San Pedro (*Whitely*); NICARAGUA; PANAMA, Calobre (*Arcé*).—COLOMBIA; VENEZUELA; AMAZONS²; PERU; BRAZIL¹; ARGENTINE REPUBLIC; ANTILLES, Haiti.

This is a variable species as regards the colour of the upper surface, some specimens being greyish, while others are of a browner hue; but we can detect no difference between some of our Mexican examples and one from the Argentine Republic, so there can be but little doubt that the same species spreads throughout the whole area. Mr. Bates speaks of it as a common and widely-distributed insect frequenting orange-orchards and open sunny places in the forests, and when sporting or quarrelling with a companion it makes a sharp cracking noise with its wings. *A. feronia* and other species have similar habits. We also noticed *A. ferentina* when alighting on the trunk of a tree turn head downwards with its wings expanded, as mentioned by Darwin when writing of an allied species*.

2. *Ageronia glauconome*. (Tab. XXVI. figg. 9, 10.)

Ageronia glauconome, Bates, Ent. Monthl. Mag. i. p. 114¹.

Ageronia ænoe, Boisd. Lép. Guat. p. 26²; Butl. & Druce, P. Z. S. 1874, p. 347³.

A. ferentinae similis, sed alis omnibus cinerascensioribus et area anticarum apicali plaga magna cretacco-alba cinereo variegata ornata; ocellis posticarum sicut in *A. ferentina*.

* Narr. Voy. Beagle, iii. p. 38.

Hab. MEXICO, Acapulco (*Markham*), Yucatan (*Boisduval*²); GUATEMALA, Polochic (*Hague*), Central valleys (*F. D. G. & O. S.*¹); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Boisduval*).—COLOMBIA?

A pretty species, distinguished by its delicate grey colour and by the extensive patch of chalky white on the apical portion of the primaries. Mr. Bates described it from specimens obtained by us in the interior of Guatemala¹, where, however, it is by no means common, and confined, so far as we know, to the department of Vera Paz. We have a single specimen from Acapulco, in Mexico, captured by Captain A. H. Markham, and it also occurs in Yucatan, according to Boisduval²; the same authority records it from Costa Rica, whence, however, we have no specimens, though we have several from the adjoining State of Nicaragua.

A single specimen captured by Mr. F. Simons at Manaure in northern Colombia differs to some extent from Central-American examples. The cretaceous white of the primaries is more extensive and more broken up with grey marks; it has also some white spots near the apex of the secondaries. These discrepancies are to some extent in the direction of *A. ferentina*, and the specimen may hereafter prove to be an extreme form of that insect, or possibly a distinct species.

b. Submarginal ocelli of secondaries black with a blue centre.

3. *Ageronia atlantis*. (Tab. XXVI. figg. 5, 6 ♂, 7, 8 ♀.)

Ageronia atlantis, Bates, Ent. Monthl. Mag. i. p. 115¹.

Alis fuscis, viridi-olivaceo marmoratis, anticis apicem versus litura fere obsoleta alba notata; posticis ocellis sex submarginalibus ornatis lineola cærulea pupillatis; subtus griseo-albis, anticarum dimidio distali pro majori parte nigerrimo, parte proximali lineis nigris variegata, posticarum parte submarginali fusco variegata et ocellis sicut supra ornata.

♀ mari similis, sed major et litura anticarum apicali magis distincta; subtus anticarum parte distali nigro variegato hand plaga nigra integra notata.

Hab. MEXICO (*Mus. Staudinger*); GUATEMALA, Chuacus (*F. D. G. & O. S.*¹, *Hague*).

The first example of this species was taken by us in the little hamlet of Chuacus in Guatemala, situated in a valley which opens into that of the Rio Motagua at an elevation of about 3000 feet above the sea. This specimen was a female and was described by Mr. Bates¹. Mr. Hague subsequently obtained a series of examples from the same spot, where alone it has yet been found. With all the characteristic markings of this genus, *A. atlantis* has peculiarities not shared by any other species except the following. The chief points of note are the strong greenish tinge of the upper surface of the wings, the rounded primaries, the blue pupil of the ocelli, and the black apical portion of the underside of the primaries of the male.

4. *Ageronia lelaps*, sp. nov.

♀ *A. atlanti* affinis et ocellis posticarum eodem modo caeruleo pupillatis, alis omnibus supra fusciscentioribus viridi haud tinctis, anticis lituris indistinctis duabus haud una transfasciatis.

♂ adhuc ignotus.

Hab. MEXICO, Ventanas (*Forrer*).

A single female specimen of this *Ageronia* was captured by Mr. Forrer at Ventanas in the State of Durango, Mexico, at an altitude of about 3000 feet above the sea. It differs from *A. atlantis* in its upper surface being browner, the apical band being dusky instead of white, and having the indications of a second band within. The ocelli are smaller, the blue pupils are obsolete on the upper surface, but are plainly visible beneath. Our single specimen is not in very good condition, and we look anxiously forward for more perfect examples, including the male.

PERIDROMIA.

Peridromia, Boisduval, Sp. Gen. t. 23. f. 5 (1858).

Ageronia, part., Hübner et auctt.

In this genus we propose to place the species of *Ageronia* which have in the male the first two branches of the subcostal nervure anchylosed in a common origin from the subcostal, and in which the lower discocellular has a double curve and meets the median halfway between the first and second branches. In the female the neururation is much more like that of both sexes of *Ageronia*; the first and second subcostal branches have each a separate origin, and the lower discocellular joins the median nearer to, if not actually at, the origin of the second branch. In other respects the two groups are very similar; the femur, tibia, and tarsus are, perhaps, more slender in *Peridromia* than in *Ageronia*, but the difference is not great; the lower radial too of the primaries is not so straight.

There are thirteen species known of *Peridromia*, the focus of the genus being the valley of the Amazons. In Central America we find seven species, all of which, with the exception of *P. guatemalena*, are also found in South America.

a. Sexes differently coloured; underside of wings black.

1. *Peridromia arethusa*.

Papilio arethusa, Cr. Pap. Ex. i. t. 77. ff. E, F¹.

Ageronia arethusa, Doubl. Gen. Diurn. Lep. p. 83²; Bates, Journ. Ent. ii. p. 314³.

Papilio laodamia, Cr. Pap. Ex. ii. t. 130. f. A⁴.

Peridromia arete, Luc. Rev. Zool. 1853, p. 310⁵ (nec Doubl.); Boisd. Lep. Guat. p. 27⁶.

Alis velutino-cyaneo-nigris, maculis cyaneis praecipue ad costam et marginem externum anticarum et margines externum et interiorem posticarum notatis; subtus nigris, pesticis punctis ad basin tribus aliisque ad marginem interiorem et externum coccineis ornatis.

♀ mari similis, sed punctis cyaneis crebrioribus, anticis fascia alba bisectis; subtus maculis coccineis majoribus.

Hab. MEXICO^{4 5}, Oaxaca (*Fenochio*); BRITISH HONDURAS, Rio Hondo (*Blancaneaux*); GUATEMALA, San Gerónimo, Polochic valley (*F. D. G. & O. S.*³), Las Mercedes (*Champion*); NICARAGUA, Chontales (*Belt*); PANAMA, Chiriqui, Veraguas (*Arcé*).—COLOMBIA; VENEZUELA²; PERU; BOLIVIA²; GUIANA^{1 2}.

Some confusion has existed regarding this species, owing to its close relationship to the South-Brazilian *P. arete**, which, however, may be distinguished from it by the upper surface of the wings of the male being much more profusely and evenly spotted with blue. The female is not so easily recognized; but, as far as we can see from our own examples, the white cross-band of the primaries in *P. arete* is narrower and more distinctly cut by the veins, the portion nearest the anal angle being broken off into a spot.

With the exception of South-eastern Brazil, *P. arethusa* is found throughout Tropical America. It was first described by Cramer from Surinam examples¹. Mr. Bates found it at many places on the banks of the Amazons and its tributaries³. In our region it occurs as far north as Mexico; in Guatemala it is found in the hot lowlands, and up to an elevation of about 3000 feet.

b. Sexes nearly alike; underside of wings nearly black or black and red.

2. *Peridromia amphinome*.

Papilio amphinome, Linn. Syst. Nat. ii. p. 779¹; Cr. Pap. Ex. i. t. 54. ff. E, F².

Ageronia amphinome, Bates, Journ. Ent. ii. p. 314³; Butl. & Druce, P. Z. S. 1874, p. 347⁴.

Peridromia mexicana, Lucas, Rev. Zool. 1853, p. 311⁵.

Alis nigris cyaneo variegatis, anticis ultra cellulam fascia sordide alba obliqua venis divisa notatis; subtus nigris, fascia anticarum ut supra et maculis subapicalibus notatis; anticarum basi et posticis pro majore parte coccineis venis nigris divis, posticis ad apicem nigris punctis cyaneis notatis, margino externo quoque nigro, alis omnibus maculis marginalibus albidis notatis.

♀ mari haud dissimilis.

Hab. MEXICO⁵, Oaxaca (*Fenochio*), Cordova (*Rümeli*); BRITISH HONDURAS, Rio Hondo (*Blancaneaux*); GUATEMALA³, central valleys and Pacific coast (*F. D. G. & O. S.*), Polochic valley (*Hague*), San Isidro (*Champion*); NICARAGUA (*Bridges*), Chontales (*Belt*); COSTA RICA (*Van Patten*⁴); PANAMA, Chiriqui and Veraguas (*Arcé*), David (*Champion*).—SOUTH AMERICA generally to Bolivia and Brazil³.

Lucas separated Mexican specimens of this insect under the name of *Peridromia mexicana*⁵, stating that the differences between them consisted in the band of the primaries in the northern form being straighter and more distinctly cut up by the veins and powdered with grey scales, and also in its having an extra spot in the apex of the primaries, and the wings being of a more rusty red. We have examined a large series of specimens closely, and though we notice the points alluded to by Lucas, they are by

* Boisduval⁶ complains that Doubleday gave his name *P. arete* to a different species from that to which he intended it to apply; but as Boisduval's name was only in MS., Doubleday's assignment of it must hold good.

no means confined to Central-American examples, but may be traced in individuals from the extreme southern limits of the range of the species. In Guiana and the valley of the Amazons the band of the primaries is for the most part of a purer white; but this character as well as the others is variable. *Peridromia amphinome* is a common species in Central America. In Guatemala it is found chiefly in the lowlands, its range in altitude probably not exceeding 3000 feet.

3. *Peridromia arienis*, sp. n. (*Ageronia arinome*, Tab. XXVI. figg. 11, 12.)

P. amphinome sed anticearum apicibus nigrescentibus, fascia anticearum multo magis indistincta, angustiore, et fusco atomata: subtus maculis tribus posticearum basalibus et aliis submarginalibus tantum coccineis diversa.

♀ adhuc ignota.

Hab. PANAMA, Lion Hill (*M·Leannan*).—COLOMBIA.

A close ally of *P. arinome*, but differs in having the apex of the primaries blacker, the band of the same wings narrower and much obscured by dusky markings. Beneath the colour is darker, and there are three red spots at the base of the costa of the secondaries instead of two, the usual number in the allied species. *P. arienis* is probably a north-western race of the Guianan and Amazonian *P. arinome*. It differs from *P. amphinome* in having the red marking of the underside of the secondaries reduced to three spots at the base of the secondaries, and a submarginal row of four or five spots on the same wings. The costa of the primaries too is more curved towards the apex.

Two male specimens are all we have at present seen of this butterfly—one sent us by M·Leannan from Panama, the other by Salmon from Frontino in the Cauca valley of Colombia.

a'. Underside of secondaries tawny.

4. *Peridromia fornax*.

Ageronia fornax, Hübn. Samml. ex. Schm. ii. t. 40. f. 1, 2¹; Doubl. & Hew. Gen. Diurn. Lep. p. 83, t. 10. f. 1²; Butl. & Druce, P. Z. S. 1874, p. 347³; Strecker, Butt. N. Am. p. 140⁴.

Alis fuscis griseo-ceruleo variegatis, anticearum dimidio apicali præter apicem ipsum sordide albo maculato, posticis ocellis serie submarginali positis; subtus anticis triente basali fulvida, reliquo fusco albo maculato; posticis pro majore parte fulvis, angulo apicali et margine externo nigris, serie macularum albarum submarginalium et aliis marginalibus albis.

Hab. NORTH AMERICA, S.W. Texas⁴.—MEXICO², Cordova (*Rümeli*); GUATEMALA, Polochic valley (*Hague*), central valleys (*F. D. G. & O. S.*); COSTA RICA (*Van Patten*³); PANAMA, Chiriqui, Bugaba (*Champion*).—COLOMBIA; VENEZUELA²; ECUADOR; BOLIVIA; BRAZIL².

A wide-ranging species first made known by Hübnér's figure¹, and subsequently by that of Doubleday². It is included in the fauna of North America by Strecker⁴, as it is

found in South-western Texas. We have specimens from Mexico and from various points in Central and South America down to Rio Grande in Brazil. The species, however, appears to be absent from Guiana and the valley of the Amazons. Its range in altitude in Guatemala does not exceed 3000 feet.

c. Underside of secondaries pure grey, or slightly tinged with fulvous.

5. *Peridromia feronia*.

Papilio feronia, Linn. Mus. Ulr. p. 283¹; Clerck, Ic. Ins. t. 31. f. 1².

Ageronia feronia, Bates, Journ. Ent. ii. p. 312³; Aurivillius, Kongl. Sv. Ak. Handl. xix. no. 5, p. 87⁴.

Alis supra fere ut in *P. fornaci*, ocellis posticarum albo pupillatis, subtus posticis cinereis, ocellis simplicibus annulo nigro macula alba circumcingente.

♀ mari sat similis.

Hab. PANAMA, Chiriqui, Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—VENEZUELA; COLOMBIA; PERU; BOLIVIA; AMAZONS VALLEY³; BRAZIL; HAITI; TRINIDAD.

This widely spread South-American species is only found within our limits in the State of Panama, its place being taken in Costa Rica and elsewhere in Central America by the very nearly allied form *A. guatemalena*, from which it differs in having the secondaries beneath pure grey without any admixture of buff. In the Amazonian region Mr. Bates tells us it is the commonest species of the genus, being found in spaces in the forest where there is no underwood, or in plantations, settling on the trunks of trees³.

6. *Peridromia guatemalena*. (*Ageronia guatemalena*, Tab. XXVI. figg. 1, 2.)

Ageronia guatemalena, Bates, Ent. Monthl. Mag. i. p. 115¹.

Ageronia feronia, Butl. & Druce, P. Z. S. 1874, p. 347²; Strecker, Butt. N. Am. p. 139³?

P. feroniæ persimilis, sed maculis anticarum paginæ superioris plerumque majoribus, ocellis posticarum cinereo nec albo pupillatis et subtus posticis ochraceo tinctis vix distinguenda.

Hab. NORTH AMERICA, S.W. Texas³.—MEXICO, Mazatlan (*Forrer*), Oaxaca (*Fenochio*), Cordova (*Rümeli*), Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Polochic valley, San Gerónimo (*Hague*), Chuacus, central valleys, Pacific slopes (*F. D. G. & O. S.*¹); NICARAGUA, Chontales (*Janson*); COSTA RICA (*Van Patten*²), Irazu (*Rogers*).

Mr. Bates separated this form from *P. feronia*¹. The differences, he says, are in the belt of dingy white spots of the fore wing, which consists of much more elongate spots giving a different aspect to the insect. The submarginal ocelli are very different from those of *P. feronia*. In the fore wing they have much larger round pupils (of a dingy grey instead of a white colour) and narrower black irides; in the hind wing they have also large suboval dingy pupils encircled by three concentric rings, two narrow and grey,

the third intermediate broad and black. Beneath almost the only difference from *P. feronia* is the pale saffron ochreous hue of the hind wings. These differences are apparent when comparing Mr. Bates's types with specimens of *P. feronia*; but with a more extensive series before us than Mr. Bates had access to we find that most of the distinctions alluded to above are of an unstable character. As a rule, however, the submarginal ocelli of *P. guatemalena* have grey and not white pupils. The under surface of the secondaries too is suffused with buff instead of being pure grey.

P. guatemalena is abundant in Mexico and Guatemala, where it is found in the hotter districts. It also occurs in Costa Rica and Nicaragua, but in Panama its place is taken by *P. feronia*.

7. *Peridromia iphthime*. (*Ageronia iphthime*, Tab. XXVI. figg. 3, 4.)

Ageronia iphthime, Bates, Ent. Monthl. Mag. i. p. 116¹.

Ageronia iphmede, Boisd. Lép. Guat. p. 26²?

P. feronia similis quoad paginam superiorem; sed subtus maculis et lineolis omnibus fusco-ferrugineo tinctis et posticis isabellino lavatis distinguenda.

Hab. MEXICO, Oaxaca (*Fenochio*), Cordova (*Rümeli*); GUATEMALA¹, Polochic valley, Pacific slopes (*F. D. G. & O. S.*), Choctum (*Hague*); PANAMA, Chiriqui, Bugaba (*Arcé*), Lion Hill (*McLeannan*).—COLOMBIA; UPPER AMAZONS¹.

The upper surface of the wings of *P. iphthime* have a strong general resemblance to those of *P. feronia*. They are, however, of rather a more dingy hue; beneath all the dark marks are of a rich brown instead of being nearly black. Mr. Bates described this species from specimens obtained by us in Guatemala¹, where it is by no means uncommon in the lowlying forests on both sides of the Cordillera. It is also found in Southern Mexico and, doubtless, in the rest of Central America, but no specimens have yet reached us from Costa Rica. Thence it spreads through Colombia to the valley of the Upper Amazons, where Mr. E. Bartlett found it on the Ucayali. In South Brazil a closely allied species, *P. epinome*, takes its place.

PANACEA.

Panacea, nobis (vice *Pandora*, nom. præoc.).

Pandora, Westwood, Gen. Diurn. Lep. p. 300, t. 43. f. 5 (1850).

If, as we believe, the insects belonging to this genus are separable from *Batesia*, the name *Pandora*, having been already used several times in zoology, cannot be retained as their generic term. Mr. Kirby in his synonymic catalogue has already pointed this out; but he gets over the difficulty by placing all the species in the genus *Batesia*. Besides having the radial nervures of the primaries parallel as Mr. Bates has indicated, instead of the upper radial being curved as in *Batesia*, there are differences in the

male anal appendages between the two that can hardly be overlooked. These are described below.

Six species of *Panacea*, as we now propose to call this genus (including that now described) have been recognized, all of which are more or less closely allied. The focus of the genus seems to be the valley of the Upper Amazons, where three species occur; two others are from Colombia, and the sixth is that described below from the State of Panama.

In *Panacea* the subcostal nervure of the primaries throws off two branches before the end of the cell; the upper discocellular is very short, the middle curved, and the lower nearly straight, meeting the median at the origin of the second branch. The front legs of the male have a stout coxa $> \frac{1}{2}$ femur + trochanter; tibia = femur; tarsus (single-jointed) a little $>$ tibia. Eyes smooth. Antennæ with 45 joints, whereof the terminal 13 form a moderate club. The secondary male sexual organs have a tegumen with a simple hook, and inside in the anal cavity is a double spine directed outwards; the harpagones have a rounded end with a depressed hook at the extremity; the penis is straight.

In *Batesia* these organs are very different: the tegumen instead of having a simple hook has a thickened piece at the end before the hook commences, the hook itself being quite small; the harpagones, instead of having a depressed hook at the end, terminate in a rounded lobe, but on the dorsal edge there is a large dentate process.

1. *Panacea lysimache*, sp. n.

Alis nitentibus prasinis dimidio basali lineis interruptis nigris transeuntibus, anticis apicibus nigris, fascia subapicali maculosa albescenti, altera ultra cellulam lata æneo micante; posticis margine externo linea angusta duplici nigra notata, ocellorum serie interiori fere obsoleta; subtus anticis nigro-fuscis, fascia subapicali alba, cellula viride maculis binis ferrugineis, posticis rufo-fuscis lineis nigris undulatis cellulam transeuntibus, serieque ocellorum submarginalium notatis.

Hab. PANAMA, Chiriqui (*Boucard*).

Only a single male example of this fine insect has yet come under our notice. This was obtained from M. Boucard, who received it from a correspondent in Chiriqui. It is a close ally of *P. procilla* of Hewitson, but differs from it in having the green band crossing the centre of the primaries beyond the cell very much broader; the black basal cross lines of both wings are less uniformly continuous, and the submarginal series of ocelli on the secondaries, so conspicuous in *P. procilla*, is nearly obsolete; the underside is rather more rufous than in the last-named species.

DIDONIS.

Didonis, Hübner, Verz. bek. Schm. p. 17 (1816); Westw. Gen. Diurn. Lep. p. 405.

This genus is a purely Neotropical one, its members ranging from Mexico to Paraguay. These are separable into three or four ill-defined races, two of which come within our

borders—one, *D. aganisa*, being restricted to Mexico and Guatemala, the other is the widely ranging *D. biblis*, which occurs as far north as Nicaragua.

Didonis is peculiar in its coloration, being dark brownish black with a red submarginal band on the secondaries of varying width, recalling certain species of *Papilio*. The palpi are peculiar, those of the male having the terminal joint short and elliptical; this in the female is much longer and more slender.

The costal nervure of the primaries is much swollen for nearly half its length; the subcostal emits two branches before the end of the cell; the upper discocellular is distinct and directed forwards; the middle discocellular is curved and the lower atrophied in the middle; the lower end meets the median nervure a little before the origin of the second branch. In the male there is a thickly felted patch of scales between the median and submedian nervures of the primaries beneath, and a corresponding patch on the secondaries above between the costal and subcostal nervures. The front legs of the male have a rather long coxa, $> \frac{2}{3}$ femur + trochanter; tibia $> \frac{3}{4}$ femur; tarsus (single-jointed) $> \frac{1}{2}$ tibia. Eyes smooth. Palpi in the male with a short elliptical terminal joint $< \frac{1}{3}$ middle joint; in the female this joint is half as long again, more slender, and $> \frac{1}{2}$ the middle joint. Antennæ with 50 joints; the club, consisting of 15 or 16 joints, is slender. The male secondary sexual organs have a tegumen with a double point and some strong folds along the outer edges; beneath these and projecting as far is another point in the anal cavity; the harpagones are rounded at their ends and hairy; at their upper extremity is a feeble incurved hook; at the extremity of the abdominal surface is a detached piece having a blunt end with strong central bristles; it also has on either side a lobe terminating in a blunt point with strong bristles directed outwards; the penis is nearly straight.

1. *Didonis aganisa*.

Biblis aganisa, Boisd. Sp. Gén. i. t. 9. f. 7¹.

Didonis aganissa, Westw. Gen. Diurn. Lep. p. 406².

Alis fusco-nigris, margine posticarum externo valde sinuato, fascia fere recta, marginibus serratis, ab apice ad angulum analem coccinea; subtus pallidioribus, posticarum fascia intus pallide rosacea, maculis ad basin tribus et una ad costæ medium coccineis.

Hab. MEXICO², Oaxaca (*Deppe, Fenochio*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, San Gerónimo, Yzabal, Motagua and Polochic valleys (*F. D. G. & O. S.*).

Boisduval first separated this insect in the 'Species Général des Lépidoptères,' giving the locality "Java," which is obviously transposed for "Mexique," applied to *Melanitis ceryx* figured on the same plate.

From Mexico *D. aganisa* spreads through Guatemala from the sea-level to an altitude of 3000 feet. In Nicaragua its place is taken by *D. biblis*, from which it differs in the red line of the secondaries running nearly straight from the apical to the anal angle, which in the other species follows the curve of the outer margin.

D. aganisa is found in second-growth woods and in clearings on the borders of the forest.

2. *Didonis biblis*.

Papilio biblis, Fabr. Syst. Ent. p. 505¹.

Didonis biblis, Bates, Journ. Ent. 316².

Papilio hyperia, Cr. Pap. Ex. iii. t. 236. E, F³.

Didonis pasira, Doubl. Gen. Diurn. Lep. p. 406, t. 31. f. 2⁴; Butl. & Druce, P. Z. S. 1874, p. 347⁵.

D. aganise similis, sed fascia posticarum coccinea haud subrecta sed margini externo parallela, venisque nigris divisa distinguenda.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*⁵), Irazu (*Rogers*).—SOUTH AMERICA from Colombia to Paraguay; HAITI.

Didonis biblis is a common species found over nearly the whole of Tropical America, and occurs within our borders as far north as Nicaragua. Though subject to slight variation there seem no sufficient grounds for subdivision of the species; at the same time we note that specimens from the Upper Amazons and the neighbouring districts have the red band of the secondaries unusually wide, agreeing with, and even exceeding in this respect, Cramer's figure of *P. hyperia* from Surinam³. We observe no difference between examples from Nicaragua and others from South Brazil and Paraguay.

Messrs. Butler and Druce⁵ identify the Costa-Rica insect with *D. pasira* of Doubleday⁴; but we believe this name to be a synonym of *D. biblis*, Fabricius.

Mr. Bates says that this insect flies about waste grounds on the borders of the forest, hovering moderately slowly over bushes².

CYSTINEURA.

Cystineura, Boisduval, Sp. Gén. t. 9. f. 1 (1836); Westw. Gen. Diurn. Lep. p. 406; Bates, Journ. Ent. ii. p. 317.

Mr. Bates considers this genus to be, with *Olina*, related to *Didonis*, *Pyrrhogrya*, &c.; but without disturbing this arrangement we cannot but feel that the differences separating them are of considerable importance. Besides the difference in the outlines of the wings the fact of the tibia and tarsus of the front leg of the male being atrophied so much as to form a simple knob at the end of the femur is peculiar in the Nymphalinæ, and recalls the structure so common in *Ithomia* and its allies. There are points too in the secondary male sexual organs described below which ought not to be overlooked.

Nine or ten species have been recognized of *Cystineura*, whereof only one, *C. amymone*, has been found within our region, though the very closely allied *C. dorcas* may also occur within the northern frontier. The other species are distributed over Tropical South America, one being found in the island of Jamaica.

The various species inhabit the borders of the forests.

The costal nervure of the primaries of *Cystineura* is very much swollen at its proximal half; the subcostal emits one branch before the end of the cell, the second at the origin of the very short upper discocellular; the middle discocellular is rounded into the lower radial, and the lower discocellular is an atrophied nervule meeting the median at the origin of the second branch. The front legs of the male have a coxa nearly = femur + trochanter; the tibia and tarsus are both condensed into a single short joint hardly longer than the trochanter. There are faint indications of a suture representing the tibio-tarsal joint, and also of a single tarsal joint in some specimens. The front leg of the female is well developed, the coxa being about $=\frac{2}{3}$ femur + trochanter; the tibia is slightly thickened at its distal end and is about $=\frac{2}{3}$ femur; the tarsus has the usual joints and spines, but there is no terminal claw. The eyes are smooth; the palpi slender, the terminal joint $>\frac{1}{2}$ the middle joint, which is of uniform width throughout. The antennæ have 41 joints, whereof about 13 form a moderate club. The secondary male sexual organs have a tegumen with a simple central spine, beneath which is a spine in the interior of the anal cavity; the harpagones have two lobes at the end, both of which are decurved, and the lower one as well as the ventral surface hairy.

1. *Cystineura amymone*.

Cystineura amymone, Mén. Cat. Mus. Petr. Lep. p. 123, t. 9. f. 6¹.

Alis griseo-fuscis, plaga magna ultra cellulam venis divisa albida, posticis fere omnino fuscis fascia maculosa transversa indistincta albida et plaga magna ad marginem externum fulva; subtus fulvescenti tinctis, maculis omnibus distinctioribus, posticis fascia altera maculosa ad basin notatis.

Hab. MEXICO (*Deppe*), Presidio, Ventanas (*Forrer*), Oaxaca (*Fenochio*), Cordova (*Rümel*), Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Yzabal, Polochic and Motagua valleys, Pacific slope (*F. D. G. & O. S.*), San Gerónimo, Cahabon (*Champion*); HONDURAS, San Pedro (*Whitely*); NICARAGUA (*Delattre*¹), Chontales (*Belt*).

A common species throughout Central America from Mexico to Nicaragua, but we have not yet received specimens from Costa Rica or further south. It exhibits slight variation in the intensity of its markings, some specimens being much darker than others and having a greater extension of grey; but all have a broad fulvous submarginal band near the anal angle of the secondaries, extending nearly to the apex.

Cystineura amymone is closely allied to *C. dorcas* of Fabricius; but this species has also a patch of fulvous towards the centre of the outer margins of the primaries, which is wanting in *C. amymone*. There are also various species in South America, but in most of these the fulvous on the upperside is absent.

VICTORINA.

Victorina, Blanchard, Hist. Nat. Ins. iii. p. 447 (1850) ; Westw. Gen. Diurn. Lep. p. 264.

Four or five species are usually associated in this genus ; but as the type (*V. stelenes*) has peculiar characters in the secondary male sexual organs which can hardly be overlooked, we have here removed *V. superba* and *V. epaphus* to the genus *Amphirene*, which has already been suggested for them, and with them *V. trayja* follows. *Victorina stelenes* thus remains the only species of the genus *Victorina*, the particulars of the range of which are given below.

The subcostal nervure of the primaries emits two branches before the end of the cell, the second running close to the subcostal for some distance before diverging to the costa ; the upper discocellular is short and directed outwards ; the middle discocellular meets the lower radial at nearly a right angle, where a short spur is emitted, no doubt a rudiment of the lower discocellular. The front legs of the male have a stout coxa about $=\frac{2}{3}$ femur+trochanter ; tibia $<$ femur ; tarsus $=\frac{1}{2}$ tibia ; tarsus single-jointed (in one specimen dissected the sutures of three short additional joints are just visible) ; antennæ with 43 joints, the terminal 10 forming a moderate club ; palpi moderately hairy, of nearly equal thickness throughout, middle joint slightly swollen towards the distal end, terminal joint about $=\frac{1}{3}$ middle joint, blunt at the end with an apical cavity ; this joint is rather longer in the female than the male ; eyes smooth. The male secondary sexual organs have a tegumen, with two swollen masses at its proximal end, each of which bears a long spike directed outwards straight along the dorsal edge ; but with a deep keel along the ventral surface. The harpagones have a simple rounded lobe at the end, and a pointed lobe directed downwards inside the surface of each harpago, and situated at about one third of its length from the end. From the outer edge of each side of the tegumen near its base a rod starts first in a downward direction and then turned outwards till it meets and apparently unites with the corresponding rod of the other side, and thus seems to act as a support to the penis. This organ is curved as in *Timetes*, and, as in that genus, has a rod extending from the hinge of the harpagones to the middle of its curve. In the interior of the penis, where this rod meets it, are some erect papillæ starting from the lower edge. These may be homologous with the external papillæ so prominent in the penis of *Amphirene superba* ; but the point requires closer investigation. The under surface of the penis near the end is lacerated. On the whole these organs resemble those of *Amphirene* in having a tegumen with two spines, instead of a single one as in *Timetes*. The harpagones, too, are much like those of *Amphirene* ; the penis itself and the structural arrangements more immediately connected with it are more like those of *Timetes* than those of any other genus we have hitherto investigated.

1. *Victorina stelenes*.

Papilio stelenes, Linn. Mus. Ulr. p. 218¹; Clerck, Ic. Ins. t. 35. f. 2².

Victorina stelenes, Bates, Journ. Ent. ii. p. 320³; Butl. & Druce, P. Z. S. 1874, p. 345⁴; Strecker, Butt. N. Am. p. 142⁵.

Metamorpha stelenes, Aurivillius, Kongl. Sv. Vet. Ak. Handl. xix. no. 5. p. 37⁶.

Alis fuscis, maculis magnis glauco-viridibus semihyalinis ornatis, anticis seriebus tribus positis, una sub venam medianam cellulam intrante, secunda ultra cellulam, tertia subapicali, maculis duabus quoque ad angulum analem, posticis fascia lata subbasali et serie extra eam (e maculis septem composita) submarginali; subtus omnino albicante glaucis area inter maculas extus et intus rufo marginatis, cellulæ anticarum fine linea sinuosa alba nigro marginata ornata.

♀ mari similis at paulo major.

Hab. NORTH AMERICA, S.W. Texas⁵.—MEXICO, Oaxaca (*Fenochio*), Cordova (*Rümeli*), Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, San Gerónimo, Polochic and Motagua valleys, Pacific slopes (*F. D. G. & O. S.*), Purula, San Isidro (*Champion*); NICARAGUA, Chontales (*Janson*); COSTA RICA (*Van Patten*⁴); PANAMA, Chiriqui (*Champion*), Veraguas (*Arcé*).—SOUTH AMERICA, Colombia to South Brazil³.

Victorina stelenes is found everywhere throughout the lowlands of Tropical America, in Guatemala not extending to a greater altitude than 3000 or 4000 feet. In its colour and general markings it resembles *Metamorpha dido*, though the difference in the shape of the wings renders it easily distinguished*. In all northern specimens we notice that besides the light green spot within the cell of the primaries, there is a second beyond it which is absent in South-American examples. In specimens from Panama it only occasionally appears as a very small spot, and this is likewise the case in Antillean insects, hence we attach but little value to the character.

Mr. Bates speaks of this species as frequenting open sunny places, such as deserted plantations and the borders of woods; which agrees with our observations.

AMPHIRENE.

Amphirene, Doubleday, List Lep. Brit. Mus. p. 86 (1844); Doubl. & Hew. Gen. Diurn. Lep. t. 33. f. 2 (1850).

This genus seems only to have been indicated by name by Doubleday, who adopted a manuscript title of Boisduval's in one of the British-Museum Catalogues, and also used it on a plate illustrating *A. epaphus* in the 'Genera of Diurnal Lepidoptera.' Prof. Westwood, however, when describing these insects did not discover sufficient difference to separate *A. epaphus* from *Victorina stelenes*, and placed them both with *A. trayja* in *Victorina*.

We now, for reasons given below, place *A. epaphus*, *A. trayja*, and *A. superba* together in *Amphirene*, leaving *V. stelenes* alone in *Victorina*.

* It will be noticed that we use Hübner's name *Metamorpha* in a different sense from Dr. Aurivillius. Our application of it dates from December 1881 (*antea*, p. 166), that of Dr. Aurivillius from the following year.

In the neururation of the wings *Amphirene* differs but little from *Victorina*. In *A. epaphus* the middle discocellular of the primaries passes into the lower radial in a simple curve, there being no trace of a lower discocellular. In *A. superba* these two nervures form an angle, where a short spur is emitted, as in *Victorina stelenes*. The tarsi of the front legs of the male in *Amphirene* are shorter in proportion than in *Victorina*, those of *A. superba* being shorter than in *A. epaphus*. In the secondary sexual organs of the male the tegumen and harpagones are much as in *Victorina*, there being no essential difference; but the penis in *Amphirene* is much dilated for more than its distal half, and there is no rod between it and the hinges of the harpagones. There is, moreover, considerable difference between the penis of *A. superba* and that of *A. epaphus*: in the former the lower surface of the distal half is flattened, and in it are two parallel rows of strong papillæ; in the latter there are no papillæ, but in the interior of the organ are two strong chitinous pieces, which bifurcate in the middle, one branch going straight forwards, the other upwards.

Of the three known species of *Amphirene*, *A. superba* is restricted to Central America from Mexico to Costa Rica; *A. epaphus* is a very common butterfly, ranging throughout our region, and southwards through the western parts of South America. It is absent from Guiana and the valley of the Lower Amazons; but occurs in numbers in South-eastern Brazil. *A. trayja*, the third and last of the genus, is found in Brazil alone.

1. *Amphirene epaphus*.

Vanessa epaphus, Latr. in Humb. & Bonpl. Obs. Zool. ii. p. 74, t. 35¹.

Amphirene epaphus, Doubl. & Hew. Gen. Diurn. Lep. t. 33. f. 2²; Butl. & Druce, P. Z. S. 1874, p. 345³.

Alis nigricanti-brunneis, anticis linea alba bipartitis dimidio apicali rufescente venis nigris diviso, posticis fascia submarginali, dimidio costali albo, dimidio anali tenui cærulescente, ciliis albis; subtus rufescenti-brunneis, anticis ad cellulæ finem maculis albis nigro circumcinctis, fascia submarginali alba intus nigro limbata, fascia quoque extra eam rufescente; macula ad costæ mediam et fascia altera brevi ab angulo anali, albis.

♀ mari similis, sed plerumque paulo major.

Hab. MEXICO, Cordova (*Rimeli*); GUATEMALA, San Gerónimo, Polochic valley, Chuacus, Dueñas, Central Valleys (*F. D. G. & O. S.*), San Isidro (*Champion*); HONDURAS, San Pedro (*G. M. Whitely*); NICARAGUA, Chontales (*Janson*); COSTA RICA (*Van Patten*³); PANAMA, Chiriqui (*Champion*), Calobre (*Aréé*).—COLOMBIA¹ to BOLIVIA.

This common species was first described by Latreille from specimens obtained in Colombia, where it is abundant, and also throughout the Andes, as far south as Bolivia. North of the isthmus it ranges to Mexico. We trace no variation between individuals in any part of this wide area. The species is in no way represented, so far as we know, in Guiana; but in South Brazil an allied form (*A. trayja*) takes its place; this, however, may at once be distinguished by having the apex of the primaries the same colour as the base, instead of being tawny. In Guatemala the range in altitude of *A. epaphus*

extends from near the sea-level to an altitude of 5000 feet; but it is, perhaps, most numerous in places of an intermediate height.

2. *Amphirene superba*. (Tab. XXVII. figg. 1, 2.)

Amphirene superba, Bates, Ent. Monthl. Mag. i. p. 161¹; Butl. & Druce, P. Z. S. 1874, p. 345².

Victorina aphrodite, Butl. P. Z. S. 1865, p. 483³.

Alis nigricanti-brunneis, anticarum apicibus paulo dilutioribus, fascia communi alba cæruleo limbata, a costa anticarum ad medium marginis posticarum externi transeunte, posticis lunulis pallide fuscis submarginalibus et intra eas alteris sagittiformibus cæruleis ornatis: subtus rufo-brunneis, area anticarum apicali et posticis ad medium rosaceo-albicantibus, posticis seriebus duabus lunularum albidis et una fulva extra eas, omnibus nigro separatim submarginalibus notatis; anticis quoque similiter extus (præter apice) marginatis; anticarum cellula ad medium serie punctorum alborum nigro marginata transfasciata alisque ad finem ejus.

Hab. MEXICO³, Cordova (*Rümeli*); GUATEMALA, Choctum, San Gerónimo, Polochic valley, Retalhuleu (*F. D. G. & O. S.*), San Gerónimo, Purula (*Champion*); COSTA RICA (*Van Patten*²); PANAMA, Chiriqui, Veraguas (*Arcé*).

Mr. Bates first described this species from specimens obtained by us in Central Guatemala, where it is by no means uncommon up to an elevation of about 4000 feet¹. It is not, however, confined to that district, for we also found it in the forest-country bordering the Pacific Ocean. It extends also to Southern Mexico, as we are unable to distinguish the insect of that district separated by Mr. Butler under the name of *Victorina aphrodite*³. Southwards it spreads as far as the State of Panama; but has not yet been found in the southern continent.

At first sight *A. superba* bears a strong resemblance to *V. trayja*; but, besides having more falcate primaries and dentate secondaries, it has beneath a series of transverse spots across the cell of the primaries, and the secondaries have three series of submarginal lunules, and there are other differences. *A. trayja*, as already remarked, is really more closely allied to *A. epaphus* than it is to the present insect.

TIMETES.

Tymetes, Blanchard in Cuv. Règne Anim. Atlas Ins. ii. t. 139. f. 1 (ex Boisduval, MS.) (1836).

Timetes, Westw. Gen. Diurn. Lep. p. 262.

Megalura, Blanch. Hist. Nat. Ins. iii. p. 446.

This genus was sufficiently indicated in the illustrated edition of Cuvier's 'Règne Animal,' where a good figure of *T. merops* is given. It contains about twenty-two species, all belonging to the Neotropical Region. Of these, thirteen are found within our borders, only four of which are peculiar to the region, the rest being more or less widely distributed over the Southern continent.

The external structure of the various species of *Timetes* presents few points of variation, with the exception of the shape of the primaries, which, in some species,

such as *T. peleus*, have a very broken external margin; in others the curves are quite simple, as in the type, *T. merops*.

In *Timetes merops* the subcostal nervure of the primaries emits the first branch before the end of the cell, the second some way beyond it. There is no upper discocellular, and the middle discocellular is short and curves into the lower radial; of the lower discocellular there is no trace. In *T. harmonia* and *T. peleus* there is a short upper discocellular in a line with the lower radial, the middle and lower discocellulars being absent. The front legs of *T. merops* have a rather slender coxa, $> \frac{1}{2}$ femur + trochanter; tibia nearly = femur; tarsus (single-jointed) = $\frac{1}{4}$ tibia; eyes smooth; antennæ with 33 joints, whereof 11 form a moderate club. The terminal joint of the palpi $> \frac{1}{2}$ the middle joint, which is slightly swollen towards the distal end. The male secondary sexual organs vary considerably in different species; but all have a common character in that the penis is much curved, and a short chitinous piece meets it in the middle of the curve, the other end of which rests at or near the hinge of the harpagones. In the majority of the species this is a simple rod; but in *T. berania* and *T. harmonia* it has a long projection directed forwards, which runs parallel to the penis itself. In *T. corinna* the lower end expands into a flat triangular piece. The harpagones have a common character in being more or less rounded at the end, without hooks or projections: the inner surface presents great diversity; the simplest form is in *T. harmonia* and *T. berania*, in which there is a patch of closely-set scales near the middle. In all the other species (except *T. coresia*) there appears to be a transverse fold on which, in the majority of species, is a patch of papillæ. In *T. merops* and *T. chiron* the lower edge of the harpagones is turned inwards, and in the former the edge itself is serrated. The tegumen in most species of *Timetes* is a simple elongated spine; but in *T. merops* there is a short lateral projection on each side.

The variation that exists in these organs, so far as we have been able to examine them, is very considerable; but with our present knowledge of them it is unadvisable to employ them in our classification. How far they will influence any future system remains to be seen.

a. Primaries elongated and strongly but bluntly falcate; anal lobe of the secondaries very prominent.

1. *Timetes peleus*.

Papilio peleus, Sulz. Gesch. Ins. t. 13. f. 4¹; Cr. Pap. Ex. t. 87. f. D, E².

Timetes petreus, Bates, Journ. Ent. p. 327³.

Megalura peleus, Butl. & Druce, P. Z. S. 1874, p. 345⁴.

Alis anticis elongatis valde hamatis, vena radiali superiore producta, margine externo valde sinuoso, posticis vena mediana elongata angulo anali quoque producta; supra fulvis lineis duabus transversis aliisque cellulam anticarum transeuntibus nigro-fuscis, posticis cauda elongata et angulo anali fuscis, hoc ocellos

duos includente: subtus ferrugineo perfusus posticis linea fusca bisectis, alis ambobus serio obsoleta ocellorum submarginalium pupillis nigris ornatis.

♀ mari similis, sed major et lineis omnibus magis distinctis forsan distinguenda.

Hab. MEXICO, Vera Cruz, Mazatlan (*Forrer*), Cordova (*Rümel*), Oaxaca (*Fenochio*), Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Coatepeque (*Champion*), San Gerónimo, Yzabal, Polochic valley (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Janson*); COSTA RICA (*Van Patten*⁴); PANAMA, Bugaba (*Champion*), Veraguas (*Arcé*).—SOUTH AMERICA, Colombia to South Brazil.

The elongated and strongly-hooked primaries of *T. peleus* render it easy to be at once distinguished from all other members of the genus. It is found commonly throughout Tropical America. Mr. Bates says³ that on the Amazons it frequents "the open sunny places, gardens, plantations, and banks of streams; settling on flowers and on the ground in moist situations."

In the males of this species there is but little variation, except in the distinctness of the black cross bands of the upper surface of the wings, which are very plain in some individuals and only just visible in others. On the under surface, too, some specimens are more mottled than others. The females seem always to have darker and broader bands on the upper surface of both wings.

b. Primaries short, sometimes falcate; anal lobe of secondaries moderately developed.

a'. A tawny band on the primaries and a purple patch on the secondaries.

2. *Timetes marcella*.

Timetes marcella, Feld. Wien. ent. Mon. v. p. 108¹.

Timetes corinna, Doubl. & Hew. Gen. Diurn. Lep. t. 32. f. 1².

Megalura valetta, Butl. & Druce, Cist. Ent. i. p. 101³; P. Z. S. 1874, p. 345⁴; Butl. Lep. Ex. p. 172, t. 60. f. 2⁵.

Megalura corita, Butl. & Druce, P. Z. S. 1874, p. 345⁶.

Timetes napo, Boisd. Léop. Guat. p. 14⁷.

Alis fuscis, anticis fascia permagna fulva ultra cellulam, et lineis transversis ad basin notatis; posticis angulo apicali usque ad medium marginis externi, fascia anticarum concolori; plaga magna alam mediam occupanto cyaneo-purpurea: subtus pallide fulvescentibus lineis albis distincte transfasciatis, lunulis albis submarginalibus quoque ornatis, eis ad angulum posticarum analem nigro intus marginatis.

♀ alis fuscis, lineis obscuris transfasciatis, anticis fascia alba ultra cellulam transvittatis, subtus fere ut in mare sed albicantiore et fascia alba paginæ superioris perluciente.

Hab. COSTA RICA (*Van Patten*^{3 5}), Cache, San Francisco (*Rogers*); PANAMA, Volcan de Chiriqui, Bugaba (*Champion*), Veraguas (*Arcé*).—SOUTH AMERICA, Ecuador⁷, Peru, Bolivia.

The figure given under the name of *T. corinna*, var., in Doubleday and Hewitson's work, undoubtedly represents this species, as pointed out by Felder, since the tawny

band of the primaries is nearly twice as broad as in Latreille's species, which is the chief distinguishing character.

Messrs. Butler and Druce described an insect from Costa Rica under the name of *T. valetta*, not recognizing that it was the female of this species. We have since received other specimens from the same locality. They are very unlike the male, being of a dark brown on the upperside, faintly marked with transverse lines, and having a white band across the primaries. Like the male it resembles the corresponding sex of *T. corinna*, except that the band is broader.

We trace *T. marcella* from Costa Rica southwards to Bolivia; but it does not extend further northwards.

As may be gathered from what has been said above, it is a close ally of *T. corinna*, which is also found from Colombia to Bolivia, but not within the confines of our country.

3. *Timetes corita*. (Tab. XXVII. figg. 7, 8 ♂, 9, 10 ♀.)

Timetes corita, Westw. Gen. Diurn. Lep. p. 263¹; Bates, Ent. Monthl. Mag. i. p. 129².

Timetes theonis, Boisd. Léop. Guat. p. 44³.

T. marcellæ persimilis quoad alarum paginam superiorem, subtus alis magis fusco-ferrugineis linea communi obscura bisectis, intus albido irregulariter marginata, extra eam nigro variegatis, lineis albidis aliis nullis. ♀ anticis fascia fulva nec alba transvittatis distinguenda.

Hab. GUATEMALA; MEXICO (*Deppe*), Oaxaca (*Boisduval*³), Cordova (*Rümeli*); GUATEMALA, Polochic valley (*F. D. G. & O. S.*), San Gerónimo, El Tumbador, Panima, Cahabon (*Champion*); HONDURAS³.

T. corita was first described by Mr. Bates, though the name had been previously applied to specimens of this species in the collection of the British Museum, by Westwood, in the list of species belonging to this genus, given in the 'Genera of Diurnal Lepidoptera.' In the markings of the upperside there is but little difference between this insect and *T. marcella*; the wings are slightly more pointed at the apex. Beneath, as indicated above, they are quite different. The female on the upperside resembles that of *T. marcella*, except that the band crossing the primaries is tawny instead of white; beneath it resembles the male, except that all the markings are much stronger. Messrs. Butler and Druce include this species in their list of the Butterflies of Costa Rica; but in this they were no doubt in error, as Van Patten's specimen, formerly in Mr. Druce's collection, belongs to the allied species *T. marcella*. So far as we know, *T. corita* is confined to Mexico and Guatemala; but we have the doubtful authority of Boisduval for its occurrence in Honduras.

Mr. Champion took it in great abundance in the forests of Alta Vera Paz, at an elevation of about 4000 feet. It frequents the banks of streams.

4. *Timetes phiale*. (Tab. XXVII. fig. 11.)

Timetes phiale, Godm. & Salv. P. Z. S. 1878, p. 270¹.

T. coritæ similis, sed alis maris subtus magis ferrugineis.

♀ multo pallidior, alis fulvo-brunneis lineis fuscis distincte transfasciatis, anticis fascia transversa ultra cellulam pallide fulva, subtus alis iis maris similibus sed paulo dilutioribus maculis valde indistinctis.

Hab. GUATEMALA, Volcan de Atitlan (*Salvin*¹).

The male of this species is very like that of *T. corita*, and can only be distinguished by the markings of the underside being very indistinct, on a paler more ferruginous ground, and on the upperside the tawny colour of the apical angle of the secondaries extends further along the costa. The female, however, is a very different-looking insect from that of *T. corita*, the markings on the upperside being much more distinct, whilst those of the underside are much less so.

The only specimens, two males and a female, we have of this species were taken by *Salvin* in a ravine on the southern slope of the volcano of Atitlan, at an elevation of about 4000 feet above the sea. Several specimens were noticed as they flew about an opening in the forest, where a small stream ran; they would occasionally alight on leaves of bushes five or six feet from the ground.

b. Whole underside of wings silvery, crossed with fine dark lines.

5. *Timetes harmonia*.

Nymphalis harmonia, Klug, Neue Schmett. t. 2. f. 3, 4¹.

Timetes harmonia, Doubl. & Hew. Gen. Diurn. Lep. t. 32. f. 2².

Alis supra læte fulvis, apicibus valde acutis, lineis quatuor fuscis transfasciatis, margine anticarum externo quoque fusco; posticis lineis angustis submarginalibus et ocellis duobus obsoletis ad angulum analem notatis; subtus argenteis lineis fulvis ut supra notatis.

♀ alis fulvo-albescentibus, lineis fuscis multo magis distinctis quam in mare.

Hab. MEXICO, Jalapa (*Deppe*), Cordova (*Rümeli*); GUATEMALA, Choctum (*Hague*).

The male of *T. harmonia* closely resembles that of *T. berania*; but the apex of the primaries is much more pointed, the tawny colour brighter, and the underside more silvery. Above the female is of almost a pure white, marked with lines, as in *T. berania*.

T. harmonia was first described by Klug from specimens in the Berlin Museum, doubtless collected by *Deppe* at Jalapa in Mexico¹. Our Mexican examples are from the neighbouring town of Cordova. In Guatemala it appears to be a very local insect, as we only know of its occurrence at Choctum, in the forest-country of Vera Paz, where Mr. Hague obtained examples of both sexes.

6. *Timetes berania*.

Timetès berania, Hew. Ex. Butt. Timetes, t. 1. f. 1¹; Bates, Journ. Ent. ii. p. 328².

Megalura berania, Butl. & Druce, P. Z. S. 1874, p. 345³.

Alis fulvis, apicibus rotundatis, marginibus et lineis angustis fuscis transvittatis; subtus fulvo-argenteis lineis fulvis sicut supra transvittatis.

♀ mari similis, sed lineis transversis alarum multo latioribus.

Hab. GUATEMALA, Polochic and Central valleys (*F. D. G. & O. S.*), Panima, Teleman (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*³); PANAMA, Bugaba (*Arcé, Champion*).—COLOMBIA; VENEZUELA; ECUADOR¹; PERU; UPPER AMAZONS^{1 2}.

First described and figured by Hewitson from specimens said to have been obtained from Quito and the river Amazons¹. As far as our experience, however, goes, it does not reach an altitude much exceeding 3000 feet. It is common in Guatemala, and thence southward in the intervening countries as far as the Upper Amazons; but Mr. Bates says it is not found on the Lower Amazons².

Hewitson's figure is a good representation of the upperside of the male; beneath it is of a silvery buff, crossed by tawny lines, situated as the bands above. That figured as the female in the same plate belongs to another species (*T. livius*). Mr. Bates describes an individual of this sex, which is now in our possession, and differs considerably from one we have from the Polochic valley. The former is of a rich tawny brown, the black stripes being in the same position as in the male, but broader and paler, while our Guatemalan insect is of a bright yellow, and has four whitish spots towards the apex; in other respects it resembles the southern specimen. The males show considerable variation in the intensity of the black lines of the upperside, which in some examples are altogether wanting, and in others only shown on the posterior wings. Mr. Bates says that the females are very rare.

7. *Timetes alcibiades*.

Megalura alcibiades, Staud. Verh. k. k. zool.-bot. Ges. Wien, xxv. p. 104¹.

Forma *T. chironis* et alis supra fere ejusdem coloris, subtus fere ut in *T. berania*.

♀ mari similis, sed major et alis supra minus rufescentibus, anticis maculis quatuor subapicalibus notatis, posticarum cauda medialiter rufescente sicut in mare; subtus magis argenteo-albis sicut in *T. livii*.

Hab. PANAMA, Chiriqui (*Ribbe*¹), Veraguas (*Arcé*).

T. alcibiades appears to be a very scarce insect, only a few specimens of it having been captured in the neighbourhood of Chiriqui by Mr. Ribbe. Possibly it has escaped observation through its close similarity on the upperside to the very common *T. chiron*. It is most nearly allied to *T. berania*, the female of which insect it strongly resembles in the brown colour of the upperside, while beneath it is of rather a darker colour.

Dr. Staudinger points out that the second short tail at the anal angle present in *T. chiron* and *T. berania* is almost obsolete in this insect. The example we possess is a male, for which we are indebted to Dr. Staudinger.

The female which we attribute to this species is very like *T. livius* in general appearance, so much so that we long thought it belonged to that insect; but, in spite of its more silvery underside, we now think it really belongs here. The middle of the caudal appendage of the secondaries is fulvous, as in the male, and it has other slight characters which point to *T. alcibiades* rather than to *T. livius*. This female was in one of Arcé's collections sent from the province of Veraguas.

8. *Timetes merops*.

Tymetes merops, Blanch. in Cuv. Règne An. Ins. ii. t. 137. f. 1¹.

Megalura merops, Butl. & Druce, P. Z. S. 1874, p. 345².

Alis pallide fuscis, lineis obscuris transeuntibus, anticarum dimidio distali maculis albis conspicuis notato subtus argenteis lineis fulvis transfasciatis.

Hab. COSTA RICA (*Van Patten*²); PANAMA, Veraguas (*Arcé*).—COLOMBIA.

A very pretty species, confined, so far as we know, to Costa Rica, Panama, and Colombia. It is of a pale brown crossed by dusky lines, the outer half of the primaries and margins of the secondaries being marked with white spots. Beneath the wings are of a pure silvery white, crossed with pale ferruginous lines as in *T. livius*.

It is a close ally of *T. egina*, which, however, besides being smaller, has fewer spots and has a more southern range.

Timetes merops is the type of the genus *Timetes*, being well figured under this name by Blanchard in the illustrated edition of 'Cuvier's Règne Animal.'

c'. Proximal half of underside of wings silvery, distal half dark.

9. *Timetes chiron*.

Papilio chiron, Fabr. Syst. Ent. p. 452¹.

Timetes chiron, Bates, Journ. Ent. ii. p. 327².

Megalura chiron, Butl. & Druce, P. Z. S. 1874, p. 345³.

Papilio marius, Cr. Pap. Ex. t. 200. f. D, E⁴.

Alis fuscis lineis pallidioribus transfasciatis, anticis ad apicem punctis tribus (interdum sex) albidis notatis; subtus linea argentea bisectis, dimidio proximo albido, lineis fulvis transfasciatis, dimidio distali fusco, lineolis submarginalibus et posticarum angulo anali ocellis cæcis tribus ornatis.

Hab. MEXICO (*Deppe*), Cordova (*Rümeli*), Oaxaca (*Fenochio*); GUATEMALA, Central valleys, Dueñas (*F. D. G. & O. S.*), Polochic valley (*Hague*), San Gerónimo (*Champion*); HONDURAS, San Pedro (*G. M. Whitely*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*³); PANAMA, Bugaba (*Champion*), Chiriqui, Veraguas (*Arcé*), Lion Hill (*McLeannan*).—COLOMBIA to SOUTH BRAZIL; HAITI; CUBA.

A very common insect throughout the whole of Tropical America, frequenting the open places in the forests and more open country. Individuals are subject to some variation on the underside. Some examples have the basal half of the wings of a pale

silvery colour crossed with darker bands, while the outer half varies from a dull tawny to dark brown, which is frequently tinged with a steely blue. The silvery band crossing the wings is always present. Cramer's figure represents a dark variety⁴.

We once witnessed a migration of this species near San Gerónimo in Guatemala. We were riding one afternoon down the mountain-side skirting the plain of Salama, when we met thousands of this species, which were flying with the wind along the hill-side. All were going in the same direction, which took them to the higher ranges of this district, and beyond into the valleys of the Polochic and Motagua.

10. *Timetes coresia*.

Nymphalis coresia, Godt. Enc. Méth. ix. p. 359¹.

Megalura coresia, Butl. & Druce, P. Z. S. 1874, p. 345².

Marpesia zerynthia, Hübn. Samml. ex. Schmett. ii. t. 51³.

Alis antieis hamatis, velutino-brunneis marginibus externis rufescentibus linea submarginali fusca, subtus linea rufa, extus valde sinuosa et nigro marginata bisectis, dimidio proximo albo, lineolis tribus fulvis transfasciatis, dimidio distali sericeo-fusco, lineolis submarginalibus rufis et nigris notatis.

Hab. MEXICO, Cordova (*Höge*); GUATEMALA, Polochic valley (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²), Caché (*Rogers*); PANAMA Chiriqui (*Champion*), Veraguas (*Arcé*).—COLOMBIA; ECUADOR; PERU; BOLIVIA; BRAZIL¹.

T. coresia may readily be distinguished by the uniform rich chocolate colouring of its upperside, which contrasts strongly with the silvery base of the wings beneath, and makes it a conspicuous insect. There is nothing similar to it in the disposition of its markings.

It frequents clearings and second-growth woods and the banks of streams in the dry season, and is often found about sugar-factories, resorting to the bruised cane after the juice has been recently extracted.

c. Primaries short, sharply falcate; anal lobe of secondaries obsolete.

11. *Timetes iole*.

Papilio iole, Drury, Ill. Nat. Hist. iii. t. 38. f. 2¹; Stoll, Suppl. Cr. t. 29. f. 4, 4 d².

Megalura iole, Butl. & Druce, P. Z. S. 1874, p. 346³.

Alarum dimidio proximo saturate fulvo, dimidio distali nigro, area discali purpureo tineta; subtus fusco-ferrugineis, lineolis variis valde sinuatis notatis.

♀ alis ad basin obscure fulvis lineis nigris distincte transfasciatis, triente apicali fusco-nigra maculis sex ad apicem notata.

Hab. NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*³); PANAMA, Bugaba (*Champion*), Chiriqui, Veraguas (*Arcé*).—COLOMBIA; VENEZUELA.

This *Timetes* is said by both Drury¹ and Stoll² to inhabit Jamaica. At present, however, we have it from the mainland alone, where it does not appear to be found

northward of Nicaragua. The lovely purple tinge on the upper surface of the wings renders it a conspicuous insect.

The female differs considerably from the male, having wings of a reddish brown with broad dark margins, and a paler stripe crossing the middle. Some specimens are, however, much brighter-coloured than others.

Mr. Champion captured many specimens of both sexes of this species on the slopes of the Volcan de Chiriqui and Bugaba, where its favourite resort was banks of streams in the dry season.

12. *Timetes hermione*.

Timetes hermione, Feld. Wien. ent. Mon. v. p. 108¹.

Timetes heraldicus, Bates, Journ. Ent. ii. p. 328².

Timetes funestis, Butl. Cist. Ent. i. p. 10³.

T. iole similis, sed alis magis falcatis, colore alarum fulvo pallidiore et colore purpureo absente distinguendus.

Hab. GUATEMALA, central valleys (*F. D. G. & O. S.*).—AMAZONS²; ECUADOR¹; PERU¹; BOLIVIA³.

Felder first described this species, under the name of *T. hermione*, from examples obtained from Ecuador and Peru¹. Mr. Bates, who met with it on the Upper Amazons, with some hesitation renamed it *T. heraldicus*², remarking that Felder, in his description of *T. hermione*, mentions neither the falcate form of the wings nor the clear limitation of the basal spot, and therefore concludes it was distinct. Subsequently Mr. Butler gave the name of *T. funestis* to a female specimen in Mr. Druce's collection from Bolivia³. We have now before us a considerable series of both sexes of this insect; and there can be no doubt that all these names refer to but one species, which must therefore retain Felder's name.

We have but a single individual of it from Guatemala, obtained by ourselves in 1862, nor have we met with it again in any of the numerous collections since received from Central America.

Mr. Bates says that it was extremely rare on the Upper Amazon, and it would appear to be even more so within our region.

It may be distinguished at a glance from *T. iole* of Drury by the absence of the purple tinge on the disk of the primaries and the more falcate form of these wings at the apex.

The female differs but little from that of *T. iole*. In some examples the base of the wings is of a brighter colour, showing considerable variation in this respect; but all the markings occur in the same position.

PYRRHOGYRA.

Pyrrhogyra, Hübner, Verz. bek. Schm. p. 43 (1816); Westw. Gen. Diurn. Lep. p. 252.

A Neotropical genus, containing about eight species, which are spread from Mexico to Brazil to the exclusion of the West-Indian Islands.

Within our region five species occur, of which all but *P. hypsenor* are also found in some part of the South-American continent.

Besides the coloration of the species, which is somewhat peculiar, the members of *Pyrrhogyra* can readily be distinguished by the great difference between the terminal joint of the palpi in the male and female, being short in the former and very long in the latter.

In *P. edocla* the subcostal nervure of the primaries emits two branches before the end of the cell, these branches lying close to one another as they approach the costa; there is no upper discocellular; the middle is nearly straight and in a line with the lower radial; an atrophied lower discocellular meets the median nervure a little beyond the origin of the second branch. The front leg of the male has a moderately stout coxa, $> \frac{2}{3}$ femur + trochanter; tibia = femur; tarsus (single-jointed) < tibia. Eyes smooth; palpi in the male with a short terminal joint $< \frac{1}{3}$, but $> \frac{1}{3}$ the middle joint. In the female the terminal joint is nearly as long as the middle joint, which in both sexes is slender and of nearly uniform width throughout. Antennæ with thirty-seven joints, but slightly thickened towards the end into a club.

The secondary male sexual organs in *P. edocla* have a simple pointed tegumen, from which is attached a piece on either side bearing a strong point which projects outward in the anal cavity; these pieces pass onwards to the ventral margin; the harpagones are very slender lobes, hairy on the outer surface and at the end; the penis is straight. In *P. otolais* these parts are almost exactly similar.

All the species of *Pyrrhogyra* are found in sunny places in the forest, where they sit upon the foliage. In the dry season they frequent streams, alighting on rocks and stony ground.

1. *Pyrrhogyra tipha*.

Papilio tipha, Linn. Syst. Nat. i. p. 776¹; Clerck, Ic. Ins. t. 32. f. 3²; Cr. Pap. Ex. t. 8. f. D, E³.

Pyrrhogyra tiphus, Bates, Journ. Ent. ii. p. 319⁴.

Papilio neærea, Linn. Mus. Ulr. p. 297⁵.

Pyrrhogyra neærea, Aurivill. Kongl. Sv. Vet. Ak. Handl. ix. no. 5, p. 97⁶.

Alis fusco-nigris, anticis macula ultra cellulam subovata alba, fascia communi lata infra eam angulum posticarum analom versus extendente, subtus anticis pro majore parte albis, parte alba lineis nigris tripartita, costa cellulæ fine et linea ultra maculam distalem coccineis, triente ad marginem externum fusca albo variegata et lineola submarginali notata; posticis albis, margine externo late fusco albido variegato, intus linea coccinea (ad costam producta), maculis sex nigris extus attingentibus notato, lineolisque submarginalibus fuscis.

Hab. NICARAGUA, Chontales (*Janson*); PANAMA, San Lorenzo, Volcan de Chiriqui,

Bugaba (*Arcé, Champion*), Lion Hill (*M'Leannan*).—COLOMBIA; VENEZUELA; LOWER AMAZONS⁴; BRAZIL.

Dr. Aurivillius has recently⁶ drawn attention to the misapplication of Linnæus's name *P. neærea*, which, instead of belonging to a species distinct from *P. tipha*, is really synonymous with that name, and precedes it by a few pages in the work in which they were both published. For this latter reason apparently the learned Doctor adopts the name *P. neærea* for the species commonly known as *P. tipha*, and, at the same time, he suggests that the species hitherto called *P. neærea* should be called *P. crameri*. The inconvenience of thus shifting the name *P. neærea* from one species to another in the same genus is obvious. As we can, without doing violence to the law of priority, still continue to use the title *P. tipha* as hitherto understood, with *P. neærea* as a synonym, we prefer to do so, adopting at the same time Dr. Aurivillius's name *P. crameri*.

Clerck's figure² no doubt represents a female of this species and agrees well with examples in our collection of that sex from Brazil. The two pairs of whitish spots shown on the primaries and the obsolete submarginal series on the upper surface are not indicated in the males, which are also of a darker hue. These markings, however, on the underside are represented by a submarginal series of very distinct white spots, which is present in all the closely allied races with which we are acquainted, except *P. hypsenor*.

P. tipha does not appear to extend into our region beyond Nicaragua, whence northward through Guatemala and British Honduras it is replaced by its last-named ally.

2. *Pyrrhogyra hypsenor*, sp. nov. (Tab. XXVII. figg. 3, 4.)

P. tiphæ similis, sed fascia alarum alba angustiori, subtus marginibus externis fuscis haud albo notatis.

Hab. BRITISH HONDURAS, Corosal (*Roe*), Rio Hondo (*Blancaneaux*); GUATEMALA, Polochic and Motagua valleys, Pacific slope (*F. D. G. & O. S.*), Zapote (*Champion*).

As mentioned above, this species differs from *P. tipha* in having the white band of the wings narrower, and also in the absence of the submarginal series of white spots beneath. All our specimens from countries north of Nicaragua are constant in these respects, and the insect therefore appears to us to require specific distinction.

Our original Guatemalan specimens were captured by ourselves, and it would appear to be rather uncommon, as we have received but few in subsequent collections from that country; so far as we know it does not extend its range into Mexico.

A Guatemalan specimen is figured.

3. *Pyrrhogyra edocla*.

Pyrrhogyra edocla, Doubl. & Hew. Gen. Diurn. Lep. p. 253. t. 32. f. 5¹; Butl. & Druce, P. Z. S. 1874, p. 348².

P. tiphae similis, sed anticis magis elongatis maculis et fasciis albis viridi lavatis, et anticis macula altera subapicali notatis; subtus anticearum linea mediana nigra, intus coccinea et posticearum costa ad basin tantum coccinea distinguenda.

Hab. MEXICO, Cordova (*Rümeli*), GUATEMALA, Polochic valley, Choctum (*Hague*), Tamahu, El Tumbador, Zapote (*Champion*); COSTA RICA (*Van Patten*²); PAMAMA, Veraguas (*Arcé*).—COLOMBIA; VENEZUELA¹; BOLIVIA¹.

A very pretty species, found commonly throughout Southern Mexico and Central America, and extending its range to Bolivia¹. Eastwards in the valley of the Upper Amazons its place is taken by *P. cupari*, a species with a much broader and paler band on the wings.

4. *Pyrrhogyra crameri*.

Pyrrhogyra crameri, Aurivill. Kong. Sv. Vet. Ak. Handl. ix. no. 5, p. 98¹.

Papilio neærea, Cr. Pap. Ex. t. 75. C, D².

Pyrrhogyra neærea, Bates, Journ. Ent. ii. p. 319³.

P. edoclae similis, sed minor, alis magis rotundatis et fascia alarum communi viridi-alba latissima, et ab omnibus hujus generis diversa linea anticearum subtus mediana absente.

Hab. COSTA RICA, Irazu (*Rogers*); PANAMA, Bugaba (*Champion*), Chiriqui, Veraguas (*Arcé*), Lion Hill (*McLeannan*).—ECUADOR; UPPER AMAZONS; GUIANA²; N. BRAZIL.

As we have already stated under *P. tipha*, the name *P. neærea* adopted by Cramer from Linnæus and used by nearly all subsequent writers is not applicable to this insect. Dr. Aurivillius's name suggested as a substitute is appropriate and must now be employed¹.

On the upperside *P. crameri* closely resembles *P. otolais*; it may, however, be readily distinguished from it by the absence of the red line on the underside of the median nervure of the primaries. Mr. Bates says it is a common insect in the forest over the whole Amazons region³; but in Central America it does not appear to extend further north than Costa Rica.

5. *Pyrrhogyra otolais*. (Tab. XXVII. figg. 5, 6.)

Pyrrhogyra otolais, Bates, Ent. Monthl. Mag. i. p. 126¹; Journ. Ent. ii. p. 318²; Butl. & Druce, P. Z. S. 1874, p. 348³.

Pyrrhogyra neis, Feld. Verh. k. k. zool.-bot. Ges. Wien, p. 473⁴.

P. crameri quoad staturam et colorem paginae alarum superioris similis; subtus anticis linea fusca intus coccinea supra venam anticearum medianam differt.

Hab. MEXICO¹, Atajac (*Hedemann*⁴), Vera Cruz (*Sallé*⁴), Cordova (*Rümeli*), Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA¹, Polochic valley (*Hague*), Motagua valley, Pacific slopes (*F. D. G. & O. S.*), Telemán, Zapote, Mirandilla, Panima, Panan, Cubilguitz (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*³).—COLOMBIA⁴; ECUADOR; UPPER AMAZONS².

P. otolais is a common species throughout our region, where individuals are very constant in their markings.

Mr. Bates says² he met with it only at San Paulo on the Upper Amazons, and remarks that the single specimen he captured there differed slightly from Mexican and Guatemalan insects. We have since received others from Mr. Whitely, taken at Pebas and various places on the upper waters of the Amazons, all showing similar differences. A specimen likewise was sent us by Dr. Felder, who received it from Bogota and marked it "*P. otolais*, var."

The chief points of divergence from the northern form are the presence of a pair of whitish spots near the centre of the outer margin of the primaries, and the rather broader and paler red markings on the underside; but we hesitate to place a specific value on such slight characters, and are content to indicate the points of variation.

Regarding *P. neis*, Felder, we have no hesitation in considering it the same as *P. otolais*; not only does the description agree, but the range indicated of *P. neis* is nearly identical with that of *P. otolais*.

One of our Guatemalan specimens is figured.

ADELPHA.

Adelpha, Hübner, Verz. bek. Schmett. p. 42 (1816).

Heterochroa, Boisd. Sp. Gén. i. t. 8. f. 4; Westw. Gen. Diurn. Lep. p. 276.

This large, almost exclusively Neotropical genus contains upwards of seventy species, of which no less than thirty-one are found within our fauna, one only of which, the aberrant *Adelpha bredowi*, passes northwards across the frontier of Mexico, where a closely allied species, *A. californica*, is also found. In South America *Adelpha* does not pass beyond the limits of Brazil and Bolivia; it is more strongly represented in the eastern slopes of the Andes than elsewhere, though Mr. Bates found thirteen species during his sojourn in the valley of the Amazons.

Regarding the position of *A. bredowi*, we have some doubts whether it ought not to be removed from *Adelpha* on account of its smooth eyes and other characters. Though the former feature associates it with *Limenitis* as usually understood, the latter, such as secondary male organs, point rather to an independent position. As for *Limenitis* itself it certainly requires revision, as the type of the genus, *L. populi*, has many points of difference from *L. camilla*, and there are Indian species with hairy eyes that require careful dissection before their position can be settled. On the whole, therefore, we think it best to leave *A. bredowi* in *Adelpha*, at the same time drawing attention to its peculiarities, to be of service when the whole group is recast.

Prof. Westwood, in his note on the genus, speaks of its affinity to *Apatura*; but this view, we think, can hardly be maintained, *Apatura* having several peculiar characters not shared by *Adelpha*.

We should have been glad to have continued the name *Heterochroa* proposed by Boisduval, and so carefully defined by Westwood; but that name has previously been used for a genus of Caryophyllaceæ. We therefore follow Mr. Kirby in falling back upon Hübner's title *Adelpha*.

In all species of *Adelpha* we have examined the primaries have a rudimentary interno-median nervure near the base of the median on the underside; this is directed rather outwards and not across towards the submedian. We find this rudimentary nervure present in "*Limenitis*" *lorquini* and in *L. camilla*, but in *Limenitis populi* we do not trace its existence.

There is but little variation in the neurulation of the primaries in *Adelpha*; the subcostal of all emits two branches before the end of the cell; the upper discocellular in some species, such as *A. iphicla*, is evanescent; in others it is very short (*A. celerio*, *A. erotia*, *A. fessonia*, *A. melanthe*, &c.); the middle discocellular is usually rounded, but in *A. fessonia* it is almost straight, and placed obliquely across the wing. The lower discocellular is always present in an atrophied state; it usually starts from the junction of the middle discocellular and lower radial, and passes in a simple curve to the origin of the second median branch. In *A. fessonia* it joins the median on the proximal side of the second branch, and in *A. bredowi* on the distal side of the same point. The neurulation of *Limenitis camilla* is practically the same as that of *Adelpha iphicla*, except that in the latter the distance from the base of the cell to the origin of the upper discocellular is greater than the distance from the same point to the origin of the second median branch; in the former the reverse is the case. *Limenitis lorquini* agrees with *L. camilla* in this respect, so does *L. populi*. But the transition between these species is completely shown in the various forms of *Adelpha*. The front legs of the male in this genus vary but little; the coxa is stout, $> \frac{1}{2}$ femur + trochanter; the tibia < femur; tarsus (single-jointed) = $\frac{1}{2}$ femur. In *A. bredowi* the tibia is short, the tarsus being equal to it; in *A. sophax* the tibia is as long as the femur, and the tarsus short. The legs of *Limenitis camilla* and *L. lorquini* are very much like those of *Adelpha*; those of *L. populi* have a much thicker tarsus. The eyes are hairy in front, except in *A. bredowi*, which agrees in this respect with *L. lorquini*, the other North-American *Limenitis*, and with *L. camilla* and *L. populi*. The antennæ have from 49 joints in *A. bredowi* to 37 in *A. leucophthalma*, with nearly every intermediate number; 12 or 14 joints form a slight club. *Limenitis populi* has the smaller number, *L. bredowi* the larger. The terminal joint of the palpi is very short, the middle joint of nearly uniform width throughout. The male secondary sexual organs are more uniform in structure than usual; the tegumen has a rather long slightly depressed central spine, beneath which is a single projecting spine in the cavity of the structure; the harpagones in most species have a lobe starting from the middle of the ventral edge, and directed upwards and slightly serrated on the inner edge; they have a longitudinal fold along the middle of nearly their whole length, and they usually end in a blunt point, which

is serrate beneath. In *A. bredowi* there are three strong teeth near the end of the ventral surface of the harpagones; there is no ascending lobe, and the spine of the tegumen in the middle of the cavity is double. The structure of these parts in *Limenitis populi* and *L. lorquini* is almost exactly like that of *Adelpha*, but *L. camilla* has the harpagones considerably produced into a depressed point.

A. Eyes hairy in front.

- a. Markings of the distal half of the secondaries beneath radiating towards the outer margin.

1. *Adelpha melanthe*. (Tab. XXVIII. figg. 1, 2.)

Heterochroa melanthe, Bates, Ent. Monthl. Mag. i. p. 129¹.

Heterochroa melantho, Butl. & Druce, P. Z. S. 1874, p. 343².

Heterochroa melane, Boisd. Léop. Guat. p. 45³ (partim).

Alis saturate brunneis, anticis fascia lata obliqua extus sinuata ultra cellulam transvittatis, maculis indistinctis albidis ad cellulæ finem; subtus ochraceis, anticis ad costam et posticis ad marginem externum lineolis fuscis radiolatis; anticarum cellula nigra albo et ochraceo pulchre maculata; posticis plaga magna discali et lineis tribus in dimidio basali transversis fuscis notatis.

♀ mari similis, sed major et alis magis retundatis.

Hab. MEXICO, Cordova (*Rümel*); GUATEMALA, San Gerónimo, Tocoy, Chiacam (*Champion*), Motagua and Polochic valleys, San Gerónimo, central valleys (*F. D. G. & O. S.*¹); HONDURAS³; NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²), Cache, Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Champion*), Veraguas (*Arcé*).—COLOMBIA³.

There seem to be three closely allied species of this form, all having a fulvous transverse band on the primaries. The northern race is the insect here treated of, which spreads throughout our region from Southern Mexico to Panama, and thence passes into the Cauca valley as far as Frontino. Further south in Colombia a slightly modified form exists, having both the apex of the primaries and the distal half of the secondaries beneath much darker: this we propose to call *Adelpha melanippe* *. The third race is *A. spruceana*, described by Mr. Bates from a specimen taken in Ecuador by Mr. Spruce on the western slopes of Chimborazo; this on the underside resembles the Colombian *A. melanippe*, but on the upperside the transverse fulvous band of the primaries is as narrow as it is in *A. lara*. The male of the insect referred to by Boisduval³ as *Hetero-*

* *Adelpha melanippe*, sp. n.

A. melanthe similis quoad picturam paginæ alarum superioris, sed subtus alis omnino obscurioribus colore ochraceo magis restricto. *A. spruceana* quoque similis, sed fascia anticarum fulva multo latiora distinguenda.

Hab. COLOMBIA.

Mus. nostr.

chroa melane probably belongs here, but the female with a white band is doubtless of another species.

A. melanthe was described by Mr. Bates from specimens captured by ourselves in the valleys of Central Guatemala. As will be seen above, it has since been taken in many other places, not only in Guatemala but elsewhere throughout our region. It inhabits thinly-wooded districts, chiefly situated at an elevation of from 2000 to 3000 feet.

b. Markings of the distal half of the secondaries beneath more or less parallel to the outer margin.

a'. Distal half of the primaries spotted with white.

2. *Adelpha demialba*. (Tab. XXX. figg. 5, 6.)

Heterochroa demialba, Butl. Cist. Ent. i. p. 77¹; Lep. Ex. p. 103, t. 38. f. 3².

Alis fusco-nigris, antecarum area apicali albo maculata; subtus ferrugineo-fuscis, anticis ut supra albo maculatis, antecarum cellula et posticis lineolis variis fuscis et glaucis transfasciatis; posticarum margine externo serrato ciliis albis.

♀ mari similis, sed major et alis nigris rotundatis.

Hab. COSTA RICA (*Van Patten*^{1 2}), Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Arcé, Champion*), Peña Blanca (*Champion*).

A remarkable species, by reason of its dark wings and the apical portion of the primaries being covered with large white spots.

Besides the type, which is in a damaged condition, we have since received several other specimens from Costa Rica; we also have it from the neighbourhood of Chiriqui. Curiously enough, of these specimens, seven in number, only two are at all perfect.

Mr. Butler's figure represents a female from Costa Rica; that now drawn is a male from Chiriqui, but, beyond usual slight difference in the shape of the wings, the sexes are alike.

A. demialba is a mountain species, being found at an elevation of 4000 to 5000 feet. It flies high in open spaces in the forest. At Peña Blanca Mr. Champion saw several specimens, but all out of reach.

b'. Band of the primaries transverse.

a''. Secondaries nearly uniform.

3. *Adelpha sophax*. (Tab. XXIX. figg. 1, 2.)

Adelpha sophax, Godm. & Salv. Ann. & Mag. Nat. Hist. ser. 5, ii. p. 265¹.

Alis brunneis, anticis fascia fulva bisectis, posticis lineis obsoletis margini externo subparallelibus notatis; subtus anticis fascia multo pallidior, maculis apicalibus et alteris cellularibus nigro marginatis notatis; posticis lineis margini externo subparallelibus nigro marginatis, una maculosa submarginali et duabus ad basin albis notatis, reliquis plerumque fulvis.

♀ mari similis, sed major et alis magis rotundatis.

BIOL. CENTR.-AMER., Rhopal., Vol. I., April 1884.

2 q

Hab. COSTA RICA, Cache (*Rogers*¹); PANAMA, Bugaba (*Arcé*).—COLOMBIA¹.

An interesting species, combining the characters of several others. On the upper-side it closely resembles *A. tizona*, *A. salmoneus*, &c.; the underside, however, is like that of *A. epione*. Our first specimens were derived from Costa Rica and Colombia; we now know it from the neighbourhood of Chiriqui, and we have also additional examples taken by Salmon in the Cauca valley.

4. **Adelpha tizona.** (Tab. XXIX. fig. 11.)

Heterochroa tizona, Feld. Reise d. Nov. Lep. p. 424¹.

Alis supra *A. sophaci* simillimis; subtus valde distinctis, maculis anticarum ad basin indistinctis, obscure cinereis maculis inter ramos medianos nullis, posticis ad basin griseis, lineis transversis cellulam trans-euntibus haud ad marginem internum productis.

Hab. PANAMA, Bugaba (*Champion*).—COLOMBIA¹; PERU.

A species of not uncommon occurrence in the neighbourhood of Chiriqui; but we have not yet met with it elsewhere within our district. We have examples from Colombia, one of which has been compared with Dr. Felder's type. The species also occurs in Southern Peru, Mr. Whitely having found it in the Cosnipata valley.

As already stated, *A. tizona* bears a strong resemblance to *A. salmoneus* on the upper-side; but they may be distinguished by the markings on the underside of the secondaries, as will be seen on reference to the figures of the two species.

It is also very similar to *A. sophax* on the upperside, but beneath differs considerably, as the figures show, that of *A. tizona* having been taken from a Chiriqui specimen. It is a forest butterfly.

5. **Adelpha salmoneus.** (Tab. XXVIII. figg. 3, 4.)

Heterochroa salmoneus, Butl. P. Z. S. 1865, p. 667, f. 1¹.

A. sophaci similis, quoad picturam alarum paginæ superioris; subtus alis omnino rufescentioribus, lineis transversis magis indistinctis, maculis ad cellulæ finem anticarum duabus nec una diversa.

Ab *A. tizona* differt alis subtus rufescentioribus et lineis posticarum transversis usque ad marginem internum productis.

Hab. GUATEMALA, Yzabal (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt*).—COLOMBIA; VENEZUELA¹.

An ally of *A. tizona* and *A. irmina*, the differences being chiefly in the markings of the underside of the secondaries; these will be best seen by reference to the figures. *A. salmoneus* seems to be everywhere a scarce species; Mr. Butler's type came from Venezuela¹, and we have specimens from Colombia. Mr. Belt obtained a few examples of it in Nicaragua, and a single insect captured by ourselves at Yzabal in Guatemala is the only evidence we have of its occurrence in that country.

b''. Secondaries with a white discal spot.

6. *Adelpha leucophthalma*.

Nymphalis leucophthalma, Latr. in Humb. & Bonpl. Obs. Zool. i. p. 247, t. 25. f. 3, 4¹.

Heterochroa mephistopheles, Butl. Cist. Ent. i. p. 7²; Lep. Ex. p. 101, t. 38. f. 4³.

Alis brunneis, anticis fascia lata fulva bisectis, posticis macula discali rotunda alba notatis; subtus rufescentibus, anticis fascia sicut supra sed pallidiore, macula ad cellulæ finem, altera basi propiore, tertia inter ramos medianos, cinereis, omnibus nigro circumcinctis; punctis duabus subapicalibus griseo-albidis; posticis fusco nebulosis macula rotunda sicut supra, altera costam mediam attingente, fasciis duabus fractis transversis cinereis ad basin nigro cinctis, serie macularum submarginalium albescente.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA, Cache, Irazu (*Rogers*); PANAMA, Peña Blanca (*Champion*).—COLOMBIA^{2 3}; PERU¹.

Though we have no specimens of this species from Peru, the country whence Latreille's type was procured, our Colombian examples (including the type of Mr. Butler's *A. mephistopheles*) agree so well with the figure in the 'Observations des Zoologie' that we cannot but consider them as identical with the insect there represented. The apex of the primaries is without tawny spots, and the white spot of the secondaries is nearly round. Nicaragua, Costa Rica, and Panama are the only districts within our region whence we have received specimens; in all these countries the next species, *A. lacina*, is found with *A. leucophthalma*. In Colombia *A. justina* takes the place of the latter species.

Mr. Champion's specimen from Peña Blanca was taken in open country away from the forest.

7. *Adelpha lacina*.

Heterochroa lacina, Butl. Lep. Ex. p. 102, t. 38. f. 5¹.

Heterochroa justina, Boisd. Lép. Guat. p. 47?².

A. leucophthalmæ similis, sed alis anticis macula (interdum duplici) subapicali fulva; posticis macula discali elongata transversa ad fines acuta, subtus maculis discali et costali conjunctis, serie submarginali macularum fasciam indistinctam formante.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*¹), Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Arce*).

This species is very closely allied to *A. justina* of Colombia and Venezuela, having tawny spots in the apex of the primaries, as in that insect. The outer margin of the fulvous band of the primaries is rather less irregular, and the white spot of the secondaries is much more elongated. It seems to be quite a scarce butterfly in Central America, for, besides the type from Van Patten's collection, we have only seen three other examples. It is probably this species to which Boisduval alludes under the name of *Heterochroa justina*².

c'. Band of the primaries subparallel to the outer margin.

c''. Transverse lines across the end of the cell of the primaries beneath.

a'''. Band common to both wings fulvous.

8. *Adelpha leuceria*. (Tab. XXX. figg. 7, 8.)

Heterochroa leuceria, Druce, Cist. Ent. i. p. 286¹.

Alis supra brunneis, fascia communi marginibus externis subparallela ad costam antecarum bifida fulva; subtus rufescentibus, fascia sicut supra albicante, serie communi macularum submarginalium indistincte albida; anticis maculis cellularibus duabus et una ultra eam cinereis nigro utrinque marginatis, posticis ad basin fasciis duabus cinereis intima utrinque extrema margine interno tantum nigro marginatis.

Hab. GUATEMALA, Polochic valley (*Hague*¹), Sinanja (*Champion*); COSTA RICA, Rio Sucio (*Rogers*).

Mr. Hague supplied us with the types of this pretty species, which were taken in the valley of the Polochic¹; Mr. Champion has since found it in an adjoining valley. It occurs, too, in Costa Rica, where Mr. Rogers captured two specimens.

It has no near allies that we know of. The tawny band running across both wings is a peculiar feature shared only by *A. ethelda* of Ecuador, a species which differs totally from the present one on the underside.

b'''. Secondaries above without conspicuous marks.

9. *Adelpha tracta*.

Heterochroa tracta, Butl. Lep. Ex. p. 102, t. 38. f. 6¹; Butl. & Druce, P. Z. S. 1874, p. 343².

Alis supra brunneis, anticis fascia lata margini externo parallela venis divisa fulva, extra eam fascia altera maculosa indistincta; posticis fasciis tribus margini externo subparallelibus obsolete fulvidis; subtus fere ut in *A. leuceria* fascia posticarum angustiore.

Hab. COSTA RICA (*Van Patten*^{1 2}), Rio Sucio (*Rogers*); PANAMA, Volcan de Chiriqui (*Arcé, Champion*).

The first examples of this insect came in Van Patten's collection from Costa Rica and were described by Mr. Butler¹. We have since obtained many specimens from Mr. Champion taken in Chiriqui, where it appears to be by no means uncommon at an elevation of from 3000 to 4000 feet.

Mr. Butler's plate represents the band of the primaries of far too pale a colour; it is, in fact, tawny brown, a darker tint than is usual in this genus.

Like *A. leuceria*, *A. tracta* is a very isolated species, but they are perhaps more nearly related to each other than to any others in the genus.

c'''. Band common to both wings white.

10. **Adelpha fessonia.** (Tab. XXIX. figg. 18, 19.)

Heterochroa fessonia, Hew. Ann. & Mag. N. H. p. 260, t. 20. f. 6¹; Mén. Cat. Mus. Petr. Lep. ii. p. 119²; Butl. & Druce, P. Z. S. 1874, p. 343³.

Heterochroa cestus, Boisd. Léop. Guat. p. 45⁴.

Alis brunneis, indistincte lineolis obscurioribus notatis, fascia communi a costa anticarum (ad venam medianam angulata) ad angulum posticarum analem transeunte alba; anticis plaga magna subapicali costam attingente fulva; subtus rufescentibus fascia communi alba ut supra, altera angustiore basi propiore, plaga fulva subapicali anticarum albido marginata et inter venas saturate fulvo notata; maculis indistinctis submarginalibus nigro-brunneis.

Hab. MEXICO, Presidio (*Forrer*), Oaxaca (*Fenochio*); GUATEMALA, Motagua valley (*F. D. G. & O. S.*); HONDURAS (*Mus. Brit.*¹); NICARAGUA², Chontales (*Belt*); COSTA RICA (*Van Patten*), Irazu (*Rogers*); PANAMA, David (*Champion*).

The white band running through both wings from the costa of the primaries towards the anal angle of the secondaries distinguishes this species from all others except *A. cestus* of Venezuela, a species with which it is no doubt closely allied. It differs, however, in having a much larger and rounder spot at the apex of the primaries, and the white transverse band of the same wings is somewhat abruptly bent where it crosses the median nervure.

Hewitson first described *A. fessonia* from a specimen in the British Museum from Honduras; we now trace it northward through Guatemala to the Mexican State of Durango. Southward it spreads to the State of Panama, but it appears to be nowhere common. Our only Guatemalan specimen was captured by ourselves in the valley of the Motagua.

It is probably this species which Boisdual refers to under the name of *Heterochroa cestus*, saying that it is fairly common in Honduras⁴.

d'''. Band on primaries wholly or almost entirely fulvous; band on secondaries white.

11. **Adelpha erotia.** (Tab. XXIX. figg. 14, 15.)

Heterochroa erotia, Hew. Ann. & Mag. N. H. xx. p. 259, t. 20. f. 3¹; Bates, Journ. Ent. ii. p. 332²; Butl. & Druce, P. Z. S. 1874, p. 342³.

Alis brunneis ad basin et marginibus indistincte lineolatis; anticis fascia irregulari a costa ad marginem internum margini externo subparallela, maculisque duabus aut tribus subapicalibus fulvis; posticis fascia mediana alba bisectis; subtus ferrugineis fasciis alarum sicut supra in anticis maculosis, anticis ad basin maculis griseo-albis nigro marginatis notatis; serie punctorum submarginalium albida; posticis ad basin lineis duabus fusco-marginatis griseo-albis transfasciatis; area submarginali fasciis tribus notata, extima maculosa albida.

Hab. GUATEMALA, Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*³), Cache, Irazu (*Rogers*); PANAMA, Chiriqui, Veraguas (*Arcé*), Bugaba

(*Champion*), Lion Hill (*McLeannan*).—SOUTH AMERICA, from Colombia to Bolivia¹; AMAZONS².

We restrict this name to individuals having the tawny band extending down to or beyond the first branch of the median nervure, as it approaches the inner margin. In some specimens the space between the first median nervule and the inner margin is more or less occupied with white, some individuals from the State of Panama having more white than is usual. When we come to Guatemala we not only find examples of the true *A. erotia*, but also another form which has been separated under the name of *A. phylaca*; in this latter insect the white band is developed at the expense of the tawny one, and extends quite up to the second median branch.

A. erotia was described by Hewitson from Bolivian specimens in the British Museum¹; it has since been found to be a common species throughout the Amazons region², and northward in Central America as far as Guatemala.

12. *Adelpha erymanthis*, sp. n. (Tab. XXIX. figg. 5, 6.)

A. erotie affinis, sed anticis magis elongatis et falcatis, posticis ad angulum analem multo magis dentatis, fascia posticarum alba ad angulum eodem acuta et limbo externo ad costam fulvo marginata; subtus *A. erotie* persimilis, parte alarum basali glauco-cærulescentiore.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA, Irazu (*Rogers*).

We have two specimens of this species, both males, which, though evidently closely allied to the common *A. erotia*, is nevertheless easy to be distinguished by the characters given above.

13. *Adelpha oberthüri*. (Tab. XXIX. figg. 3, 4.)

Heterochroa oberthürii, Boisd. Lép. Guat. p. 46¹.

A. erotie similis quoad alarum paginam superiorem, sed minor; subtus alis omnino grisescentioribus et maculis omnibus magis indistinctis; fascia anticearum linea ferruginea longitudinaliter divisa.

Hab. GUATEMALA¹, Polochic valley (*Hague*), Zapote and Panan (*Champion*); COSTA RICA, Irazu (*Rogers*); PANAMA, Volcan de Chiriqui, Bugaba (*Arcé, Champion*).

We have great doubts whether this species is really separable from *A. thesprotia* of Felder from Colombia. The only differences which we can detect are that the fulvous band of the primaries is narrower, and that the white band of secondaries nearly always passes a short way into the primaries.

Through the kindness of M. Charles Oberthür we have had an opportunity of comparing Boisdual's type with our series from Guatemala; and we have also named specimens of *A. thesprotia* from Dr. Felder, so that we are able to compare typical examples.

A. oberthüri is a forest species.

14. *Adelpha urraca*.

Heterochroa urraca, Feld. Wien. ent. Mon. vi. p. 116¹.

Heterochroa lorzæ, Boisd. Lép. Guat. p. 46².

Heterochroa plesasure, Butl. & Druce, P. Z. S. 1874, p. 342³.

A. oberthüri et *A. eroticæ* affinis, sed maculis ad apicem anticarum supra fulvis nullis aut obsoletis; subtus anticis fascia fulva multo latiore distinguenda.

Hab. GUATEMALA², Polochic valley (*Hague*), Panima (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*³); PANAMA, Bugaba (*Arcé, Champion*). —BRAZIL, Rio Negro¹.

A specimen compared with the type of *Heterochroa urraca* agrees with the type of Boisdual's *H. lorzæ*, so that the latter becomes a synonym of the former. The species is closely allied to *A. cocala*, differing chiefly in the fulvous band of the primaries not bifurcating towards the costa, there being in the males no fulvous spots in the apex; and in the more diffused markings of the distal half of the primaries beneath it may be further distinguished from *A. oberthüri*, which is found throughout the same country.

e'''. Band on primaries partly fulvous, partly white, sometimes connected, sometimes broken.

15. *Adelpha diocles*. (Tab. XXX. figg. 3, 4.)

Adelpha diocles, Godm. & Salv. P. Z. S. 1878, p. 270¹.

Alis brunneis ad basin et marginibus indistincte lineolatis, anticis maculis duabus cellulam transeuntibus rubidis fusco utrinque marginatis; macula elongata subapicali a costa ad ramum medianum primum extensa fulva; fascia communi a vena anticarum mediana ad angulum posticarum analem alba; subtus albidis fasciis ut supra, sed latioribus et lineis fulvis nigro limbatis utrinque marginatis; anticarum cellula maculis duabus fulvis nigro utrinque marginatis una ad medium altera ad finem positis, linea submarginali indistincta fusca ad angulum posticarum nigra bene definita.

Hab. PANAMA, Volcan de Chiriqui (*Arcé*¹).

The single specimen described by us in 1878 still remains unique. On the upper-side the species bears some resemblance to the South-Brazilian *A. syma*, but beneath it differs materially from that species, as it does from all others with which we are acquainted.

16. *Adelpha cytherea*.

Papilio cytherea, Linn. Mus. Ulr. p. 305¹; Clerck, Ic. Ins. t. 39. f. 3².

Najas moderata cytherea, Hübn. Samml. ex. Schm. i. t. 62³.

Heterochroa cytherea, Bates, Journ. Ent. ii. p. 333⁴.

Adelpha cytherea, Aurivill. K. Sv. Vet. Ak. Handl. xix. no. 5, p. 103⁵.

Papilio elea, Cr. Pap. Ex. t. 242. f. D, E⁶.

Alis brunneis, ad basin et marginibus indistincte lineolatis, anticis fascia lata ultra cellulam a costa ad marginem internum extendente fulva, fascia communi ramum medianum secundum fere attingente usque ad angulum posticarum analem extendente alba; subtus fulvis, ad basin lineolatis fasciis sicut supra; serie communi submarginali punctorum alborum notatis.

Hab. GUATEMALA, Cahabon, Cubilguitz (*Champion*), Polochic valley (*Hague*), Yzabal, Choctum (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt*); COSTA RICA, Irazu (*Rogers*); PANAMA, Volcan de Chiriqui and Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—COLOMBIA to SOUTH BRAZIL.

With the exception of Mexico this species spreads throughout Central America and the whole of the South-American continent as far as South Brazil. In all this wide area we find great constancy in its general markings, though the width of both the fulvous and white bands varies to some extent. We found *A. cythera* most abundant in Guatemala in open places in the forests of Vera Paz, which lie to the north of Coban, at an elevation of about 1200 feet above the sea, whence it descends to the coast.

The early synonymy of *A. cytherea* has recently been carefully worked out by Dr. Aurivillius, who considers Hübner's plate best represents the Linnean species⁵.

17. *Adelpha lerna*. (Tab. XXIX. figg. 12, 13.)

Heterochroa lerna, Hew. Ann. & Mag. N. H. xx. p. 257, t. 20. f. 4¹; Bates, Journ. Ent. ii. p. 332²; Butl. & Druce, P. Z. S. 1874, p. 343³.

Alis brunneis, ad basin et marginibus indistincto lineolatis; anticis plaga magna ultra cellulam a costa ad ramum medianum secundum extensa, maculisque tribus subapicalibus fulvis; fascia communi a ramum anticarum medianum ad angulum posticarum analem transeunte alba; subtus ferrugineis maculis omnibus bene definitis fascia communi alba sicut supra, anticis cellula parte basali albida linea longitudinali notata, macula alba utrinque nigro limbata ad finem, alisque duabus ultra eam, triente apicali et serie submarginali maculosis; posticis lineis duabus arcuatis ad basin albis, area marginali externo fasciis maculosis albidis quatuor notatis.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*³); PANAMA, Volcan de Chiriqui, Bugaba (*Arcé, Champion*).—PERU; BOLIVIA; AMAZONS VALLEY².

A common species in the State of Panama, whence it ranges northward as far as Nicaragua; but we have not yet seen specimens from Costa Rica, though its name is included in Messrs. Butler and Druce's list of Dr. Van Patten's collection³. It was described originally by Hewitson from Bolivian specimens¹. Mr. Bates found it sparingly on the Upper Amazons² in sunny places in the forests. In general appearance this insect is not unlike *A. phylaca*, but the apical fulvous spot of the primaries is completely separated from the white band, and the markings of the underside, especially those of the outer margin of the secondaries, are more clearly defined.

18. *Adelpha phylaca*. (Tab. XXX. figg. 1, 2.)

Heterochroa phylaca, Bates, Ent. Monthl. Mag. iii. p. 135¹.

A. lernæ similis quoad alarum paginam superiorem, sed plaga anticarum fulva fasciam albam attingente; subtus maculis omnibus magis indistinctis et plerumque griseo indutis distinguenda.

Hab. MEXICO, Cordova (*Rümeli*); GUATEMALA, Polochic valley (*Hague*¹).

This, perhaps, is a form more nearly allied to *A. erotia* than to *A. lerna*. It is found in Guatemala, and differs from the former species in the white band of the primaries extending from the inner margin to the second median branch.

We are doubtful whether this character will ultimately be tenable, as the amount of white in this part of the wing-band is certainly variable. Mr. Bates described this species from a female specimen, and compared it with *A. iphiela*, which is not its nearest ally ¹.

In addition to the type we have several male examples from Guatemala, all from the valley of the Polochic. We have also one from Cordova in Mexico.

19. *Adelpha pithys*. (Tab. XXVIII. figg. 7, 8.)

Heterochroa pithys, Bates, Ent. Monthl. Mag. i. p. 128 ¹.

Alis brunneis ad basin et marginibus indistincte lineolatis; anticis plaga submarginali bisinuata fulva, fascia communi lata a vena mediana usque ad angulum posticarum analem extensa alba, angulo ipso fulvo nigro bipunctato; subtus pallidissime fulvis, plaga et fascia communi sicut supra, alis ambobus ad basin lineolatis, ad marginem externum indistincte fasciolatis.

Hab. GUATEMALA, Tablelands (*F. D. G. & O. S.*¹) and Polochic valley (*Hague*).

This is a rare species in Guatemala, for besides the type (a male now figured) obtained by us in the highlands near Dueñas ¹, only two other examples have reached us, and these were sent by Mr. Hague from the valley of the Rio Polochic.

It is closely allied to *A. donysa*, but differs in having the white band common to both wings wider, and in the markings of the underside being more faintly impressed. Both species have the fulvous spot at the anal angle of the secondaries, in which are two black dots.

So far as Guatemala is concerned, both *A. pithys* and *A. donysa* seem to fly together at altitudes varying from upwards of 5000 feet to as low as 2000 feet and under. *A. pithys*, however, has not yet been traced to Mexico.

20. *Adelpha donysa*.

Heterochroa donysa, Hew. Ann. & Mag. N. H. xx. p. 260, t. 20. f. 5 ¹.

Heterochroa ræla, Boisd. Léop. Guat. p. 46 ².

A. pithys similis sed major, fascia alarum communi alba multo angustiore et pictura alarum subtus multo obscuriore et ad basin griseo tincta.

Hab. MEXICO ^{1 2}; GUATEMALA, Calderas (*F. D. G. & O. S.*), Polochic valley (*Hague*); HONDURAS? ².

This species was described by Hewitson as long ago as 1847 ¹ from specimens in the British Museum and his own collection said to have been sent from Mexico ¹.

Boisduval's *A. ræla* also came from Mexico and belongs here, as an examination of the type proves. Honduras is also given as within its range; but this is perhaps

BIOL. CENTR.-AMER., Rhopal., Vol. I., April 1884.

2 R

doubtful². In Guatemala we took a male near Calderas at an altitude of 7000 feet on the Volcan de Fuego; but we have other specimens from the Polochic valley, showing that *A. donysa*, like its near ally *A. pithys*, has a wide range in elevation.

A. donysa may be distinguished from the last species by its narrower white band and by the markings of the underside being more distinct. It also appears to be a somewhat larger insect. A Brazilian ally of both these species is *A. abia* (Hew.).

21. **Adelpha basilea.** (*A. epiphicla*, Tab. XXVIII. figg. 9, 10.)

Papilio basilea, Cr. Pap. Ex. t. 188, f. D¹.

Heterochroa basilea, Bates, Journ. Ent. ii. p. 331²; Butl. & Druce, P. Z. S. 1874, p. 342³.

Alis brunneis ad basin et marginibus indistincte lineolatis; plaga anticarum subapicali valde irregulari et macula (vena divisa) ultra eam fulvis; fascia communi a vena mediana ad angulum posticarum analem alba; subtus ferrugineo-fuscis, ad basin griseo fasciatis, ad marginem externum fusco fasciolatis, plaga anticarum et fascia communi sicut supra.

♀ mari similis, sed fascia communi alba in anticis ad ramum medianum secundum tantum extensa.

Hab. MEXICO, Acapulco (*Markham*), Cordova (*Rümeli*); GUATEMALA, Polochic valley (*Hague*), Zapote and Tocoyn (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*³); PANAMA, Bugaba, San Lorenzo (*Arcé & Champion*).—COLOMBIA; UPPER AMAZONS².

This species has long stood in our collection under the MS. title of *A. epiphicla*, and is thus named on our Plate; we find now, however, that it is not separable from the well-known South-American *A. basilea*. It also stands in M. Oberthür's collection under a MS. name of Boisduval's.

A. basilea is a common species in Guatemala, whence we have a good series of examples. It appears to be an inhabitant of the low country. The species is closely allied to *A. iphicla*, but may always be recognized by the presence of a second apical spot on the primaries.

All our female examples have the white band in the primaries shorter than in the male, and we suppose this to be a normal character.

22. **Adelpha iphicla.** (*A. iphicleola*, Tab. XXVIII. figg. 11, 12.)

Papilio iphicla, Linn. Syst. Nat. i. p. 780¹; Drury, Ill. Nat. Hist. i. p. 27, t. 14. f. 3, 4².

Heterochroa iphicla, Bates, Journ. Ent. ii. p. 331³; Butl. & Druce, P. Z. S. 1874, p. 342⁴.

Adelpha iphicla, Aurivill. Kongl. Sv. Ak. Handl. xix. no. 5, p. 106⁵.

Heterochroa iphicleola, Bates, Ent. Monthl. Mag. i. p. 128⁶.

A. basileæ similis, sed macula ad anticarum apicem fulva absente distinguenda, anticis plaga fulva tantum ornatis.

Hab. MEXICO, Mazatlan (*Forrer*), Oaxaca (*Fenochio*), Valladolid in Yucatan (*Gaumer*); GUATEMALA⁵, San Gerónimo, Panima, Tamahu, Cubilguitz (*Champion*), Choctum, Polochic valley (*Hague*), Yzabal, Motagua valley, Pacific slopes (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*⁴), Cache, Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Champion*).—SOUTH AMERICA to GUIANA² and BRAZIL; CUBA.

We have examined a very large series of this insect not only from Central America but also from various parts of the Southern continent, and a selection of these, some sixty in number, present no tangible differences that we can detect. We are therefore obliged to place Mr. Bates's name as a synonym of that of Linnæus as represented by Drury⁵.

A. iphiola is a very common species wherever it is found. In Guatemala it may be met with nearly everywhere from the sea-level up to an elevation of 4000 feet.

23. *Adelpha basiloides*. (Tab. XXVIII. figg. 15, 16.)

Heterochroa basiloides, Bates, Journ. Ent. ii. p. 332¹.

Heterochroa lydia, Butl. Ann. & Mag. N. H. ser. 3, xvi. p. 398².

Heterochroa lemnia, Feld. Reise d. Nov. Lep. p. 417³.

A. iphiolæ persimilis, sed fascia alba anticarum ultra venam medianam extendente distinguenda.

Hab. MEXICO¹ (*Sallé*³), Cordova (*Rümelí*); GUATEMALA, San Gerónimo (*F. D. G. & O. S.*); HONDURAS²; NICARAGUA, Chontales (*Belt, Janson*); PANAMA, Volcan de Chiriqui (*Champion*), Calobre (*Arcé*).

Mr. Bates's description of this species was based upon a single female specimen from Mexico, from which country we have several other examples, including a male. The latter is destitute of the small elongated white spot between the radial nervules of the primaries, and thus exactly resembles another male from Calobre in the State of Panama, which was examined by the late Rudolph Felder and pronounced by him to belong to the species described as *H. lemnia*, with the type of which he compared it. Felder's description, however, was based upon a female example from Mexico, and attention is expressly drawn to the presence of the white spot in question, thus making it certain that the names *H. lemnia* and *H. basiloides* both refer to the same butterfly. It must be remarked, however, that none of our females from the State of Panama have this white spot; but in one of our Guatemalan examples it is almost obsolete, and we are therefore unwilling to admit of the existence of two species on so slight and evanescent a character.

A. basiloides, thus considered, probably ranges throughout our region, but we have not yet seen specimens from Costa Rica.

24. *Adelpha felderi*. (*A. falcata*, Tab. XXVIII. figg. 13, 14.)

Heterochroa felderi, Boisd. Lép. Guat. p. 45¹.

Adelpha falcata, Godm. & Salv. P. Z. S. 1878, p. 270².

A. iphiolæ quoad paginam alarum superiorem similis, sed anticis magis falcatis, et macula posticarum anali absente; subtus omnino magis ferrugineis maculis ad basin disjunctis griseis utrinque nigro marginatis; serie subapicali macularum unica et intra eam fasciola obscura notatis.

Hab. MEXICO, Cordova (*Rümelí*); GUATEMALA, Polochic valley (*Hague*²), Sinanja, Cubilguitz (*Champion*); COSTA RICA¹.

We are indebted to M. Charles Oberthür for the opportunity of examining Boisduval's type of this species, which we find to be identical with the insect we named *A. falcata* in 1878².

On the upperside *A. felderi* has a general resemblance to *A. iphicla*; but the primaries are more falcate, and there is no fulvous spot at the anal angle of the secondaries. On the underside the present species has peculiarities of its own, as will be seen on reference to our figure.

With the exception of a single specimen from Mexico, all our series are from Guatemala, where it is by no means an uncommon insect. Boisduval's type is marked from Costa Rica, but we have ourselves no evidence of its occurrence in that country.

d''. Three black-margined white spots in a triangle at the end of the cell of the primaries beneath.

25. *Adelpha celerio*.

Heterochroa celerio, Bates, Ent. Monthl. Mag. i. p. 127¹; Journ. Ent. ii. p. 330, t. 13*. f. 4².

Papilio iphicla, Cr. Pap. Ex. t. 188. f. E, F (nec Linn.)³.

Alis fusco-brunneis ad basin et marginibus indistincte lineolatis, anticis plaga subapicali fulva, fascia communi lata a vena mediana ad angulum posticarum analem alba viridescente vix tineta; subtus ferrugineis, plaga et fascia ut supra; anticarum cellula, stria basali, maculis tribus triangulum formantibus ad finem et altera infra eam albis nigro marginatis; posticis fascia transversa ad basin nigro limbata, alis ambabus margine externo maculis lunulatis serie duplici positib. albidis ornatis.

Hab. MEXICO, Oaxaca (*Fenochio*), Cordova (*Rümeli*); GUATEMALA¹, Polochic valley, Chuacus, Choctum (*Hague*), Panima, Chiacam (*Champion*), San Gerónimo, central valleys, Pacific slopes (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*), Irazu (*Rogers*); PANAMA, David, Volcan de Chiriqui, Bugaba (*Champion*), Lion Hill (*McLeannan*).—COLOMBIA; AMAZONS VALLEY¹; N. BRAZIL.

This is one of the commonest species of *Adelpha* in Central America, being found throughout the region from Southern Mexico to Panama; thence it passes into South America, and is, according to Mr. Bates, found sparingly throughout the Amazon region². It inhabits the low country up to an elevation of 3000 feet.

26. *Adelpha serpa*.

Heterochroa serpa, Boisd. Sp. Gén. i. t. 8. f. 4¹.

A. celerioni similis, sed fascia communi angustiore et viridescenti haud tineta; subtus alis omnino flavicanti-oribus, lunulis posticarum submarginalibus latioribus serie duplici lineola angustissima divisa.

Hab. GUATEMALA.—BRAZIL¹.

The authority for including this Brazilian species in our fauna rests upon a single specimen formerly in Mr. Bates's collection, labelled as coming from Guatemala. This example is a female, and differs in no way from many others in our collection

from Rio Janeiro and its neighbourhood. We have no record of its occurrence in any intermediate locality.

Mr. Kirby, in his catalogue, groups some five or six species as varieties of *A. serpa* of Boisduval, including amongst them *A. celerio*, *A. massilia*, and *A. paræca*. In this we are unable to follow him, as will be seen from the reasons given under the head of each species.

27. **Adelpha sentia.** (Tab. XXIX. figg. 9, 10.)

A. serpæ similis, sed macula fulva anticarum multo minore, fascia communi alba ad finem anteriorem venis divisa et fulvo extus tincta; subtus alis omnino albescentioribus, plaga anticarum apicali haud ad cellulam extensa, fascia fulva posticarum interiori intus albescente.

Hab. BRITISH HONDURAS, Corosal (*Roe*).

Our description of this species rests upon a single male specimen obtained by Mr. Roe in British Honduras. Though undoubtedly allied to *A. serpa*, *A. celerio*, and *A. massilia*, it is obviously distinct, as reference to the figures will show. The white band of the wings being tinged with fulvous at its upper extremity serves to separate it from all these species.

28. **Adelpha pione**, sp. n. (Tab. XXIX. figg. 16, 17.)

A. serpæ similis sed fascia alarum alba multo angustiore, et plagula fulva anticarum in stria maculosa usque ad angulum analem posticarum ducta.

Hab. PANAMA, Chiriqui (*Mus. Staudinger*).

This species, of which we have only seen a single female specimen in Dr. Staudinger's collection from Chiriqui, is most nearly allied to *A. seriphia* of Felder, from Venezuela; but it not only has a very narrow white band, but a second band of a fulvous colour lies outside this and appears to be a continuation of the fulvous apical spot of the primaries. Beneath it is very similar to *A. serpa*.

29. **Adelpha massilia.** (Tab. XXIX. figg. 7, 8.)

Heterochroa massilia, Feld. Reise d. Nov. Lep. p. 423¹.

A. celerioni similis, sed fascia communi angustiori et ad finem superiorem maculosa.

Hab. MEXICO (*Sallé*¹), Cordova (*Rümeli, Höge*).

A number of specimens, obtained by both Höge and Rümeli in Southern Mexico, are, we believe, referable to this species, which was described by Dr. Felder from examples taken by Sallé in the same country. It differs chiefly from *A. celerio* in the narrowness of the white band in the wings, but more especially by that portion which lies in the primaries being broken up into distinct spots both on the upper and lower sides.

30. **Adelpha paræca.** (Tab. XXVIII. figg. 5, 6.)

Heterochroa paræca, Bates, Ent. Monthl. Mag. i. p. 127¹.

Heterochroa emathia, Feld. Verh. k. k. zool.-bot. Ges. Wien, 1869, p. 473².

A. celerioni quoque similis, sed fascia communi forsan angustiore et pure alba, macula fulva infra plagam fulvam notata; subtus alis omnino magis distincte picturatis et lunulis submarginalibus, præcipue eis anticarum, distinctioribus.

Hab. MEXICO, Potrero (*Hedemann*²), Cordova (*Rümeli*), San Gerónimo (*Champion*), plain of Salama (*Hague*), central valleys (*F. D. G. & O. S.*); COSTA RICA, Rio Sucio (*Rogers*).

Mr. Bates, in describing this species, compared it with *A. serpa*, from which it differs in the white band being entire from one end to the other. Beneath the general colour is whiter, the outer border of the white band is much darker in colour, the double row of submarginal lunules is more pronounced, besides minor differences.

We have little doubt that the species described by Rudolph Felder under the name of *H. emathia*, from Potrero in Mexico, belongs to this species. Not only do Mexican specimens from the same district agree with our Guatemalan type, but notes we took on this species, when in Vienna some few years ago, confirm us in this view.

In Guatemala *A. paræca* is by no means a common species; our type, and all the specimens we have since received were taken in the neighbourhood of San Gerónimo in Vera Paz. A single specimen from Costa Rica does not differ materially from more northern specimens.

B. Eyes smooth.

31. **Adelpha bredowi.**

Heterochroa bredowii, Hübn. Zutr. ex. Schmett. f. 825, 826¹.

Limenitis eulalia, Doubl. & Hew. Gen. Diurn. Lep. t. 36. f. 1².

Alis fuscis, cellula anticarum maculis duabus indistinctis transversis nigro utrinque marginatis, linea altera nigra inter eas; plaga magna subtriangulari subapicali fulva; fascia communi a costa anticarum fere ad angulum posticarum analem alba, in anticis in maculis disjuncta; subtus parte proximali fulvida lineis griseis nigro marginatis variegatis; parte distali læte brunnea, lunulis submarginalibus serio duplici positis albidis, posticis fascia alba utrinque nigro limbata et fascia altera angusta extra eam grisea notata.

Hab. NORTH AMERICA, Arizona.—MEXICO^{1 2}, Chihuahua (*A. Buchan-Hepburn*), Oaxaca (*Fenochio*); GUATEMALA, San Gerónimo (*F. D. G. & O. S.*), Polochic valley (*Hague*), Santa Rosa in Vera Paz (*Champion*).

Californian examples of a species allied to this Butterfly have been separated by Mr. Butler under the name of *Heterochroa californica*, several small differences serving to distinguish them. The true *A. bredowi*, however, occurs in Arizona, as Mr. Morrison's specimens recently sent from there prove to belong to the southern rather than to the northern form.

A. bredowi is a local species sparingly distributed in Mexico and only found in

Guatemala in the department of Vera Paz. Here we used not unfrequently to meet with it, especially in the neighbourhood of San Gerónimo and in open places near Santa Rosa at an elevation of more than 4000 feet above the sea.

LIMENITIS.

Limenitis, Fabricius, in Ill. Mag. f. Ins. vi. p. 281 (1807) ; Westwood, Gen. Diurn. Lep. p. 274.

Nearly thirty species are included in this genus which belong to North America, Europe, and Asia, including the Philippine Islands, Celebes, Java, and other islands of those seas. In our country but one species occurs, and this only on the northern frontier of Mexico. This insect is perhaps only a modified form of one of the widely distributed species of North America. The species from this region seems quite congeneric with *Limenitis camilla* of Europe, which diverges slightly from the typical *L. populi*, the atrophied lower discocellular nervule of the primaries meeting the median at the origin of the second branch instead of beyond it, and in having a rudimentary spur on the lower side of the median as in *Adelpha*, this spur being absent in *L. populi*. The subcostal nervure of the primaries of *L. camilla* (the species we have dissected) emits two branches before the end of the cell; the upper discocellular is short and directed forwards, the middle curves rather abruptly into the lower radial, and the atrophied lower discocellular is sinuous and meets the median at the origin of the second median branch. The front legs of the male have a moderately stout coxa $> \frac{1}{2}$ femur + trochanter, tibia $<$ femur; tarsus slender pointed $> \frac{1}{2}$ tibia; eyes smooth; terminal joint of palpi very short, middle joint long and of nearly uniform width. The male secondary sexual organs have a pointed tegumen, beneath which two chitinous slips meet in the middle line forming a short spine; the harpagones are long and decurved, projecting considerably beyond the point of the tegumen; there is on the inner surface an upturned lobe slightly serrated on the edges, as in so many species of *Adelpha*. The penis is short.

1. *Limenitis arizonensis*.

Limenitis ursula, var. *arizonensis*, W. H. Edw. Papilio, ii. p. 22¹.

Alis supra viridescente nigris, anticis maculis submarginalibus novem viridibus ornatis ciliis inter venas albis; posticis fascia lata ultra cellulam viridi venis divisa, maculis submarginalibus octo albido-viridibus et extra eas ad marginem lunulis ejusdem coloris notatis, ciliis inter venas albis; subtus æneo-viridibus, anticis ad apicem brunnescentibus maculis, una cellulari, altera ad finem ejus, ochraceis nigro marginatis, maculis quoque ochraceis ad marginem externum, lineis lunulatis duabus submarginalibus albis; posticis maculis tribus basalibus ochraceis nigro marginatis, maculis quoque septem ochraceis et serie duplici lunulis albis submarginalibus ornatis.

Hab. N. AMERICA, Arizona¹.—MEXICO, N.W. frontier (*H. K. Morrison*).

It is doubtful if this form is really separable from the more northern *L. astyanax* (Fabr.) or, as Mr. W. H. Edwards calls it, *L. ursula* (Fabr.)¹. The primaries are,

however, more produced, there are no white spots on the costa near the apex, beneath the wings have a more metallic sheen, and there are other slight differences which, taken with the difference of habitat, seem of some importance.

This butterfly is included in our fauna on the strength of a single male specimen sent us by Mr. H. K. Morrison from the United States and Mexican frontier, between Southern Arizona and Northern Sonora.

Mr. W. H. Edwards has given an interesting account of the relationships of the North-American butterflies of this form, showing that distinguishing characters between *L. astyanax* (= *L. ursula*), *L. proserpina*, and even the white-banded *L. artemis*, cannot always be traced *. With these *L. arizonensis* will probably have to be placed, unless it be proved to have a definite area in which its distinctive characters though slight are fairly constant.

CHLORIPPE.

Chlorippe, Boisduval, Lép. Guat. p. 47 (1870).

In this genus we place, with a few exceptions, the Neotropical species hitherto included by most writers in *Apatura*. The neurulation of the primaries is much as in that genus, the subcostal emitting two branches before or at the end of the cell. The difference from *Apatura* consists in the shape of the front legs of the male, which have the tibia and tarsus flattened and divided into three longitudinal sections by two grooves running along each of these joints. These legs are always of a pale green colour, and this, too, seems to be characteristic †.

Chlorippe thus considered contains about twenty-three species, which are distributed over the Neotropical region, some, such as *C. cyane*, having a very wide range.

There seem to be three sections at least of this genus, one represented by *C. laure* and *C. cyane*, the second by *C. vacuna*, and the third by *C. zunilda*, the two former having the same neurulation and structure of front legs; in the latter the second subcostal branch starts at the end of the cell and the joints of the legs are less flattened. The secondary male sexual organs in *C. laure* have a tegumen with a central somewhat depressed spine, below which, in the anal cavity, is a strong slightly upturned central spine; the harpagones are hairy at the end and on the outer surface, but are without spines. In *C. vacuna* the tegumen is shorter and stouter, and the central piece below is also shorter and pointed downwards and not upwards; the sexual armature in *C. zunilda* is much as in *C. laure*. The palpi in *Chlorippe* vary in the length of the terminal joint, which is short in *C. laure*, not above one fifth the middle joint, which is slightly

* 'Butterflies of North America,' second series, part viii. *Limenitis* I.

† Messrs. Butler and Druce in noticing this genus of Boisduval's speak as if the describer had said the palpi were green, and finding that they were not so, at once rejected the name *Chlorippe*. But it was the front legs and not the palpi which Boisduval rightly describes as green.

swollen towards the distal end. In *C. cyane* the terminal joint is longer and more conical. The palpi of *C. vacuna* are like those of *C. cyane*.

In *Chlorippe* as in *Apatura* there are indications of two or three tarsal joints in the front legs of the male; these are shown by a slight constriction at each joint and an almost obliterated suture.

a. Second subcostal branch emitted at the end of the cell.

1. *Chlorippe felderi*, sp. n.

Apatura zunilda, var., Felder, Wien. ent. Mon. vi. p. 117¹.

Alis fuscis violaceo-micantibus, anticis maculis ad cellulæ finem et aliis ultra eam albidis; cellula quoque indistincte maculata; subtus rufescente fuscis, anticis ad basin fulvis, nigro in cellula maculatis, extra eam albo punctatis: posticis lineola undulata transversa rubida bisectis, ultra eam ocellis duobus inter ramos medianos nigris cæruleo pupillatis.

♀ mare multo major, alis magis rotundatis, colore violaceo absente; anticis fascia obliqua lata ultra cellulam fulva, subtus posticis lineis tribus submarginalibus rubidis (in mare obsoletis).

Hab. PANAMA, Chiriqui (*Ribbe*).—COLOMBIA¹ to PERU.

Dr. Felder pointed out that Bogota specimens of this insect differ from the true *C. zunilda* from South Brazil in several particulars, and we have a specimen from the former locality marked by him *Apatura zunilda*, var. *occidentalis*. The chief points of difference consist in the upperside of the wings being more deeply tinged with blue, the three spots between the median and costal nervures smaller, the three beyond these much further removed from the apex, and the outer stripe on the secondaries paler. We have five northern male specimens ranging from Chiriqui to Peru, all of which are pretty constant in their markings, and differ from the Brazilian *C. zunilda* in the points above mentioned; hence we have thought it best that the northern insects should be separated, and pass under a separate name; and as Dr. Felder first mentioned the points of difference, we have called it after him.

b. Second subcostal branch emitted before the end of the cell.

2. *Chlorippe clothilda*.

Apatura clothilda, Feld. Reise d. Nov. Lep. p. 437, t. 57. f. 4, 5¹.

Alis fusco-nigris, area tota interna nitidissime cyaneo micante; anticis maculis tribus subobsoletis ultra cellulam; subtus ferrugineo-fuscis, anticearum cellula fulva lineis nigris transvittata, maculis albis ultra cellam ad angulum analem et aliis subparallelis ad apicem; posticis linea valde irregulari a costæ medio ad medium marginis interni, lineisque duabus undulatis submarginalibus ferrugineis; ocello inter ramos medianos cæruleo pupillato.

♀ alis multo magis rotundatis colore cyaneo absente; anticis fascia obliqua lata ultra cellulam transeunte fulva, subtus fascia anticearum fulva obvia.

Obs. *A. agathinæ* affinis, quoad picturam paginæ alarum inferioris, sed colore alarum supra micante cyaneo distinguenda.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Bugaba (*Champion*), Chiriqui, Veraguas (*Arcé*).—COLOMBIA¹.

BIOL. CENTR.-AMER. Rhopal., Vol. I., June 1884

Originally described by Dr. Felder from a single specimen sent him from Colombia by Lindig¹, this species has now been traced to the province of Chiriqui, and in a single female specimen to Nicaragua, where, however, as elsewhere, it is by no means common.

At first sight the relationship of *C. clothilda* appears to be with *C. cyane* and *C. cherubina*, the upper surface of the wings having a similar brilliant blue gloss. On the underside, however, it reveals an affinity to *C. agathina* and its allies, and to this section of the genus it undoubtedly belongs. We are in some doubt regarding the female of this species, of which we have only a single specimen from Nicaragua, a locality a long way from the previously recorded range of the species. This specimen bears the same relationship in colour to the male of *C. clothilda* as the sexes of *C. agathina* do to one another; and as it has characters in common with the male, we feel justified in placing it here. In general appearance this female resembles *Adelpha salmonens*.

3. *Chlorippe callianira*. (*Apatura callianira*, Tab. XXX. figg. 9 ♂, 10, 11 ♀.)

Apatura callianira, Mén. Cat. Mus. Petr. Lép. i. p. 87, t. 2. f. 6¹.

Apatura thaumas, Bates, Ent. Monthl. Mag. i. p. 130².

C. felderi quoad mares similis, sed major, colore alarum violaceo saturatiore, maculis ultra cellulam albidis majoribus; posticis strigula subapicali angulum analem versus extendente fulva.

♀ omnino differt, alis fuscis multo pallidioribus, anticarum dimidio distali albo maculato, posticis lineis submarginalibus distincte notatis.

Hab. MEXICO (*coll. Staudinger*); GUATEMALA, Motagua and central valleys (*F. D. G. & O. S.*²), Tocoy (*Champion*); NICARAGUA (*Delattre*¹).

Ménétriés described and figured the male of this species from specimens obtained by Delattre in Nicaragua under the name of *Apatura callianira*¹, and it was subsequently redescribed by Mr. Bates from examples taken by ourselves in the interior of Guatemala². It is by no means a common Butterfly in Central America, for amongst all the collections since received from that country we have only been able to add one other specimen to our series, a male captured by Mr. Champion at Tocoy. But it occurs in Mexico, whence Dr. Staudinger has received a specimen which he recently submitted to us.

The female differs considerably from the male, being of a pale mottled brown without any purple gloss. The outer portions of the primaries are marked with white spots instead of being banded. It thus closely resembles the female of *C. vacuna* from Brazil, to which species it is nearly related. *C. elis* occupies an intermediate position between these two, ranging from Colombia to Bolivia, and undoubtedly belongs to the same section, though of this last-named insect we have not yet seen a female.

4. *Chlorippe pavonii*.

Nymphalis pavonii, Latr. in Humb. & Bonpl. Obs. Zool. i. p. 197, t. 18. f. 3, 4¹.

Apatura pavonii, Hew. Ex. Butt. *Apatura*, f. 3, 4²; Butl. & Druce, P. Z. S. 1874, p. 342³.

Chlorippe mentas ♂, Boisd. Lép. Guat. p. 48⁴.

Alis fuscis violaceo suffusis, fascia communi fere obsoleta ultra cellulam albescente, altera submarginali vix conspicua, anticis macula subapicali fulva; subtus fere ut in *A. callianira*, anticis haud albo eodem modo maculatis, posticis linea mediana multo rectiore.

♀ fusca, fascia communi lata alba, anticis macula subapicali fulva sicut in mare; subtus ut supra, sed alis multo pallidioribus et lineis submarginalibus notatis.

Hab. MEXICO, Mazatlan (*Forrer*), Cordova (*Rümeli*), Oaxaca (*Fenochio*), Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Rio Hondo (*Blancaneaux*), Corosal (*Roe*); GUATEMALA, Las Mercedes, Pantaleon, Telemán (*Champion*), Polochic valley (*Hague*), Motagua valley, Pacific slopes (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*³); PANAMA, Volcan de Chiriqui, David (*Champion*), Veraguas (*Arçé*).—COLOMBIA¹; VENEZUELA; ECUADOR.

Through the kindness of M. Charles Oberthür we have been able to compare Boisdual's type of *Chlorippe mentas* with our series of *C. pavonii*, and after a careful examination we find that it belongs to that species.

C. pavonii is a very common insect throughout its range. Some individuals, however, show a slight amount of variation, both in the width of the whitish stripe crossing both wings, and also in the size of the orange spot towards the apex of the primaries. Boisdual founded his *C. mentas* chiefly on the small size of this spot; but on an examination of our series, numbering nearly forty specimens, we cannot admit that this is a tangible character. The females likewise vary to some extent.

The insect figured by Felder under the name of *Apatura angelina* which Boisdual imagined to represent a variety of the female of his *C. mentas*, belongs to another section of the genus, in which the male has the brilliant blue-green band crossing the centre of both wings.

We are not aware that *C. pavonii* has any very close ally.

The female has a superficial resemblance to such species of *Adelpha* as *A. iphicla* and *A. celerio*.

5. *Chlorippe laure*.

Papilio laure, Drury, Ill. Nat. Hist. ii. t. 17. f. 5, 6¹.

Chlorippe laura, Boisd. Lép. Guat. p. 47².

Apatura acca, Feld. Reise d. Nov. Lep. iii. p. 435, t. 57. f. 2³.

Apatura druryi, Butl. & Druce, P. Z. S. 1874, p. 342⁴.

Alis fuscis, cæruleo, præter dimidium anticarum distale, lætissime suffusis; fascia lata communi in anticis fulva, in posticis alba, anticis macula apicali quoque fulva; subtus anticarum apice et posticis argenteis, fascia ut in pagina superiore, anticis lineis tribus prope cellulæ finem nigris maculisque nigris ad angulum analem; posticis margine externo albo.

♀ major, alis cæruleo inornatis, fascia communi omnino alba, macula bene separata fulva prope anticarum costam, macula apicali nulla; alis ambabus lineis submarginalibus obscuris notatis.

Hab. MEXICO (*Sallé*), Presidio (*Forrer*), Cordova (*Rümeli*), Oaxaca (*Fenochio*) GUATEMALA, Polochic valley (*Hague*), Yzabal, Motagua valley, Pacific slope (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Janson*); COSTA RICA (*Van Patten*⁴); PANAMA, Chiriqui (*Arcé*), Bugaba (*Champion*).—COLOMBIA; VENEZUELA.

Although Drury states¹ that he received the specimen from which his description and figure of *C. laure* were taken "from a part of Africa situated about six degrees of north latitude," there can be no doubt that he really refers to this insect, whose range we have given above.

Doubleday's figure of *C. laure*, as pointed out by Boisduval, undoubtedly refers to another insect. It exhibits none of the beautiful blue colour shown on the upper-side of that species, and Brazil and the West Indies are given as the locality where it is found, while the true *C. laure* does not, so far as we can trace it, extend south of Venezuela.

C. laure is included by Messrs. Butler and Druce in their catalogue of the Butterflies of Costa Rica⁴, under the name of *Apatura druryi* of Hübner, a closely allied but distinct insect, inhabiting the island of Cuba.

The outer margins of *C. druryi* are much paler in both sexes, but especially in the female, and the double-spotted submarginal line is more strongly marked. Besides this there is a third closely allied species inhabiting Peru and the Upper Amazons, *C. griseldis*. In this insect all the colours, including the purple gloss on the upperside, are of a darker hue, and the tawny spot at the apex of the primaries of the male is absent.

6. *Chlorippe linda*.

Apatura linda, Feld. Wien. ent. Mon. vi. p. 117¹.

Apatura plesaurina, Butl. & Druce, Cist. Ent. i. p. 102²; P. Z. S. 1874, p. 342³; Butl. Lep. Ex. p. 173, t. 60. f. 4⁴.

Apatura laura, Burm. Deser. Phys. Rep. Arg. v. p. 181⁵ (nec Drury).

C. laure affinis, sed colore cæruleo alarum maris absente differt.

♀ a femina *C. laure* fasciæ anticarum parte superiore fulva nec alba dignoscenda.

Hab. COSTA RICA (*Van Patten*^{2 3 4}); PANAMA, Bugaba (*Arcé*).—ECUADOR; PERU; AMAZONS VALLEY; BRAZIL; PARAGUAY; ARGENTINE REPUBLIC⁵.

A single specimen procured by Van Patten in Costa Rica was named *Apatura plesaurina* by Messrs. Butler and Druce. They compared it with *Chlorippe laure* and pointed out its chief differences from that species; to this, however, it is not very closely allied, having no blue on the upper surface of the wings. The above-named example is now before us, and after comparing it carefully with our series of *C. linda*,

a species having a wide range and showing throughout a certain amount of variation, especially in the width of the band crossing the wings, we feel that we are unable to separate it from that insect. A female obtained by Arcé at Bugaba confirms us in this view; it has the white band of the primaries extending nearly to the median nervure, which is not the case in our most southern specimen.

Mr. Butler's figure of *C. plesaurina* is much too dark throughout.

We have a specimen of *C. linda* from Paraguay, which renders it most probable that it is to this species that Dr. Burmeister refers under the name of *A. laura* ⁵.

7. *Chlorippe cyane*. (Tab. XXXI. figg. 1, 2 ♀.)

Nymphalis cyane, Latr. in Humb. & Bonpl. Obs. Zool. ii. p. 82, t. 36. f. 3, 4¹.

Chlorippe cyane ♀, Boisd. Léop. Guat. p. 49².

Apatura lucasii, Doubl. & Hew. Gen. Diurn. Lep. ii. t. 45. f. 2³; Butl. & Druce, P. Z. S. 1874, p. 342⁴.

Apatura laurentia, Hew. Ex. Butt., *Apatura*, f. 5, 6.

Chlorippe mentas ♀, Boisd. Léop. Guat. p. 48⁵.

Alis nigro-fuscis, litura aream internam posticarum occupante (interdum in marginem anticarum internum extendente) metallico-cyanea, certa luce in viridem mutante, area cyanea crescente; subtus anticis præter apicem fulvis nigro maculatis, apicibus et posticis sordide sericeo ochraceis, lineola transversa sinuata ultra cellulæ finem eunte.

♀ alis fuscis, fascia communi in anticis fulva, ad costam bifurcata, in posticis alba cyaneo utrinque tineta, lineis submarginalibus obscuris notatis; subtus mari similis, linea posticarum transversa recta.

Hab. MEXICO, Cordova (*Höge, Rümeli*); GUATEMALA, Polochic valley (*Hague*); COSTA RICA (*Van Patten* ⁴), Irazu (*Rogers*); PANAMA, Volcan de Chiriqui and Bugaba (*Arcé, Champion*).—COLOMBIA¹; VENEZUELA; ECUADOR; PERU; BOLIVIA.

Although Latreille's figure of this insect is easily recognizable, it is not a good representation of it¹. All the colours are far too pale. Hewitson, however, faithfully depicts it in Doubleday and Westwood's 'Genera of Diurnal Lepidoptera,' under the name of *Apatura lucasii* ³. Both these figures have the blue patch confined to the secondaries, and in our series we find that this is the case in all specimens from Ecuador, Peru, and Bolivia. In Colombian insects we observe it extending to the inner margin of the primaries; and as we get still further north we have this colour encroaching, till in Mexico it has become a blue spot of considerable size on the primaries.

C. cyane is allied to *C. clothilda*, but perhaps it is still more closely related to a species we have lately received from the Argentine Republic which Dr. Burmeister has called *Apatura lucasii* *. When looked at from in front the blue marking in all specimens increases considerably and extends over nearly the whole base of the wing,

* *Chlorippe burmeisteri*.

Apatura lucasii, Burm. Descr. Phys. Rep. Arg. v. p. 182 (nec Doubleday).

C. cyane affinis, sed area discali secundariorum saturiore cyanea.

the central portion becoming greener; this, however, is not observable in any other position.

The female of Boisduval's *Chlorippe mentas* belongs here, as proved by an inspection of the types.

8. *Chlorippe cherubina*. (Tab. XXXI. figg. 3, 4 ♀.)

Apatura cherubina, Feld. Reise d. Nov. Lep. p. 435¹.

Apatura laurentia, Butl. & Druce, P. Z. S. 1874, p. 342² (nec Godart).

C. cyane affinis, sed colore cyaneo posticarum fere ad costam anticarum extendente distinguenda.

♀ a femina *C. cyane* forsitan vix distinguenda, sed fascia communi alarum ad costam anticarum in maculas disjuncta.

Hab. MEXICO, Cordova (*Rümelî*); GUATEMALA¹, Polochic valley, Dueñas (*F. D. G. & O. S.*), San Gerónimo (*Hague*), Las Mercedes (*Champion*); COSTA RICA (*Van Patten*⁵); PANAMA, Volcan de Chiriqui, Bugaba (*Champion*), Veraguas (*Arcé*).—WESTERN SOUTH AMERICA from Colombia to Bolivia¹; Rio Negro in North Brazil¹.

This *Chlorippe* is very closely allied to *C. seraphina* (Hübner) and it is questionable whether it is really distinct. It is, however, a larger insect, and the blue band of the wings is wider. The true *C. seraphina* does not enter our fauna, though it is found in Colombia in company with the allied form. In Brazil *C. seraphina* alone is found. Regarding the females of this species and of *C. cyane*, we are in considerable doubt whether we have rightly assigned our specimens to their respective males, and further we are also in doubt if the females of these species can always be distinguished from one another. Of what we consider to be females of *C. cherubina* we have only two specimens, which differ from a considerable series of females associated with *C. cyane* in having the band of the primaries broken up into spots instead of being entire to nearly the costal margin.

C. cherubina was separated by Dr. Felder upon specimens from various parts of South America, with which he included Guatemalan examples obtained by ourselves.

DOXOCOPA.

Doxocopa, Hübner, Samml. ex. Schm. iii. t.—; Scudder, Rep. Peabody Ac. Sci. 1871, p. 30.

Some American entomologists hesitate to separate this group of Butterflies from the genus *Apatura*, but Mr. Scudder seems rightly to urge its definite independent position. Not only does the subcostal nervure of the primaries emit but a single

♀ valde dissimilis a femina *A. cyane*, alis multo pallidioribus, fascia communi omnino sordide fulva, extra eam altera submarginali ejusdem coloris.

Hab. ARGENTINE REPUBLIC, Tucuman (*Burmeister*), Sierra de Tortoral, Catamarca (*E. W. White*).

The male of this insect hardly differs from that sex of *A. cyane*, but the specific characters are in the female, which are indicated above. We have several males and two females, all taken by Mr. E. W. White in the Sierra de Tortoral, in Catamarca, in the Argentine Republic.

branch before the end of the cell instead of two, as in *Apatura*, but the secondary sexual characters of the male differ considerably from those of *Chlorippe* in having two points to the tegumen instead of one, and none in the anal cavity instead of a prominent one; the harpagones have a small, stout, recurved spine at the extremity. The front legs of the male are somewhat intermediate in shape between those of *Apatura* and of *Chlorippe*; the tibia is slightly swollen at its distal end, but its anterior surface is rounded and not grooved as in *Chlorippe*.

Regarding the appropriation of Hübner's name *Doxocopa* for this genus, which we limit to *Apatura celtis* and its allies, it may fairly be questioned whether it is rightly applicable. Hübner first employed it* to a set of species, nearly all of which are true *Apaturæ*, and it was only in one of the plates forming the third incomplete volume of the 'Sammlung exotischer Schmetterlinge' that he figured his *Doxocopa idyja*, which is one of the same group as *Apatura celtis*. But his having done so, renders, we think, *Doxocopa* a name available for this genus as restricted; to employ it thus is better than coining a new title.

Only one species of *Doxocopa* certainly occurs in Mexico and Guatemala, but *D. leilia* (W. H. Edw.) occurs in Arizona and may pass our northern frontier.

In North America some six species have been described; these are reduced to two, each with two varieties, by Mr. Strecker. In the Antilles *D. idyja* is the only species; this occurs in Cuba and Haiti.

1. *Doxocopa argus*. (*Apatura argus*, Tab. XXX. figg. 12, 13 ♂, 14 ♀.)

Apatura argus, Bates, Ent. Monthl. Mag. i. p. 130¹.

Alis ferrugineis, triente anticarum apicali nigra intus fulvo marginata, maculis duabus subapicalibus duabusque alteris inter ramos medianos albis; posticis serie ocellorum submarginali et extra eam serie punctorum fulvescentium fusco marginatis: subtus glauco-fuscis, anticarum cellula ferrugineo transfasciata et terminata, posticis linea ferruginea bisecta, extra eam glaucescentibus; ocellis ut supra sed albo pupillatis. ♀ mari similis, sed multo major et pictura posticarum subtus valde indistincta.

Hab. MEXICO, Cordova (*Rümeli*), Oaxaca (*Fenochio*); GUATEMALA, San Gerónimo (*Champion*), Chisoy valley (*Hague*), Motagua valley (*F. D. G. & O. S.*).

This *Doxocopa* was described by Mr. Bates from a male specimen captured by ourselves in the Motagua valley in Guatemala; and we have since received other examples, including a female from the same country, and several males from Mexico.

D. argus has no near allies in our country, but it is closely related to *D. clyton* of N. America and *D. idyja* of Cuba and Haiti, differing from both in the black apex of the primaries with its white spots. Our female is very much larger than the male, and the markings on the secondaries are less distinct.

* Verz. bek. Schm. p. 49.

PREPONA.

Prepona, Boisduval, Sp. Gén. i. t. 7. f. 13 (1836); Westw. Gen. Diurn. Lep. p. 299.

This genus contains, according to Mr. Kirby, nineteen species; but the lines of demarcation between some of them are drawn with such uncertainty that a closer examination of the different species will probably result in a considerable reduction of their number. In Central America we only recognize six, three of which reach to Guatemala, and one to Mexico. Four of the six species belong also to the southern continent.

All are inhabitants of the hotter forest-region. As might be expected from their strong build, these insects have a powerful and rapid flight.

The subcostal nervure of the primaries emits two branches before the end of the cell—the first branch starting from the middle of the costal side of the cell, the third branch starts just beyond it, and the upper fork of the subcostal bends rather abruptly downwards near the end. The upper discocellular is very short, and directed slightly outwards; the middle discocellular is short, and there is an atrophied lower discocellular which reaches the median nervure beyond the second branch; the secondaries have a rudimentary nervule across the cell, which reaches the median nervure at the origin of the second branch. There is a narrow prediscoidal cell. The front legs of the male have a stout coxa about=femur+trochanter; tibia < femur; tarsus slightly > tibia. Terminal joint of the palpi short, about $\frac{1}{4}$ middle joint, which is flattened and curved and of nearly uniform width throughout. The antennæ have about 56 joints and terminate in a slender club. The secondary male organs have a tegumen terminating in a short, slightly depressed point, and in the centre of the anal cavity depending from the tegumen is an opaque, transverse strap, the outer edge of which is rounded: the harpagones are elliptical lobes, with their outer edges slightly rolled inwards; they are turned up at the end and terminate in two spines, below which they have long hairs directed outwards. The penis is short, straight, and stout. These organs do not suggest any close affinity to any of the genera near to which *Prepona* is placed.

a. Tuft near the inner margin of the secondaries in the male black.

a'. Under surface of wings not divided by a straight black line.

1. *Prepona demophon*.

Papilio demophon, Linn. Mus. Ulr. p. 215¹; Clerck, Icon. Ins. t. 29. f. 2².

Prepona demophon, Bates, Journ. Ent. ii. p. 337³; Butl. & Druce, P. Z. S. 1874, p. 342⁴; Aurivill.

Kongl. Sv. Ak. Handl. xix. no. 5, p. 35⁵.

Papilio sisymphus, Cr. Pap. Ex. t. 158. f. C⁶.

Potamis superba thalpius, Hübn. Samml. ex. Schm. i. t. 71⁷.

Alis nigris, fascia communi lata maculisque ad finem ejus in costam anticarum viridi-cæruleis; subtus sordide argenteo-fuscis fusco nebulosis et lineis variis nigris notatis, linea nigra a costa posticarum fere ad angulum

analem ducta, extra cellulam leviter curvata integra paulo sinuosa; maculis obsoletis septem submarginalibus, illa ad angulum analem duplici.

♀ mari similis, sed major.

Hab. GUATEMALA, Polochic valley (*Hague*), San Isidro (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*⁴); PANAMA, Volcan de Chiriqui and Bugaba (*Champion*), Calobre (*Arcé*).—SOUTH AMERICA, from Colombia to South Brazil.

This species in its typical form is widely spread throughout the tropics, from Guatemala to South Brazil, and is well represented both by Clerck² and by Hübner⁷. Cramer's figure⁶ shows a somewhat aberrant form in which the under surface of the wings are strongly marked with dark blotches; but the essential characters of the true *P. demophon* being all present, we agree with Mr. Bates in placing Cramer's name as a synonym of that of Linnæus³.

In the true *P. demophon* the black transverse line which crosses the secondaries starts from a point on the costa about one third of its length from the base; this line follows roughly the curve of the outer margin, and then turns towards the anal angle; it is not abruptly sinuated or broken in its course, and it crosses the median nervure almost at right angles. The outer margin of the secondaries is hardly undulating, and the outer edge of the blue band of the primaries is but slightly indented.

It is with reference to these small points that both the species which follow are differentiated.

As in the Amazons region³, *Prepona demophon* is common in Central America, but perhaps more so in the State of Panama than in Guatemala, the northern limit of its range. It inhabits forests and second-growth woods, often settling on trees with its head downwards. Its flight is powerful and rapid.

2. *Prepona camilla*, sp. n. (*P. demophon*, Tab. XXXI. figg. 9, 10.)

P. demophonti similis, sed anticarum fascia cærulea extus magis indentata; alis subtus magis ochraceis argenteo vix tinctis, anticis fascia bicurvata margini externo subparallela fusca, fascia posticarum transversa magis sinuata præcipue ad ramos medianos, maculis submarginalibus magis distinctis et margine ipso magis sinuato.

♀ mari similis, sed major.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Bugaba (*Champion*), Veraguas (*Arcé*).

We have several specimens of this form of *Prepona demophon*, which seem to be sufficiently distinct to warrant this separation from that species. Though the typical species is variable, the differences pointed out above go beyond the limits we assign to it. These will be seen on comparing the figure, representing a male from Veraguas, with a specimen of *P. demophon*.

3. *Prepona phædra*, sp. n.

P. demophonti similis, sed posticis ocellis septem submarginalibus notatis; alis subtus multo magis obscuris, fasciola per cellulam anticarum valde sinuata, linea nigra transversa posticarum valde interrupta ad venam subcostalem et ad venam medianam.

Hab. PANAMA, Volcan de Chiriqui (*Trötsch*).

We are indebted to Dr. Staudinger for bringing this species under our notice, as no specimens have as yet been sent to us. It seems certainly distinct from both *P. demophon* and *P. camilla*, the distinct row of submarginal ocelli of the secondaries alone rendering it not difficult of recognition; in addition to this, the transverse black band of the secondaries beneath is almost as much broken as in *P. amphitoe*, which again differs in the silvery tint of the wings beneath.

4. *Prepona amphitoe*.

Nymphalis amphitoe, Godt. Enc. Méth. ix. p. 407¹.

Prepona amphitoe, Bates, Journ. Ent. ii. p. 337².

P. demophonti similis, sed subtus alis argenteo-cinereis (nec ochraceis), linea posticarum transversa interrupta et valde sinuosa dignoscenda.

Hab. GUATEMALA, Ducñas, central valleys (*F. D. G. & O. S.*), San Juan in Vera Paz (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*), Cache (*Rogers*); PANAMA, Chiriqui (*Boucard*), David, Volcan de Chiriqui (*Champion*), Lion Hill (*McLeannan*).—COLOMBIA to SOUTH BRAZIL.

There is scarcely any difference between this species and *P. demophon* on the upper-side, but beneath it is of a silvery grey (not ochreous), and the lines are always black or dusky, and that crossing the centre of the secondaries, although taking much the same direction as in *P. demophon*, is always strongly angulated, which is not the case in the other species. We find that certain specimens vary much in the same direction as in *P. demophon*, being clouded with an obscure ashy colour.

It is tolerably abundant in Central America; but Mr. Bates says it is less common than *P. demophon* throughout the Amazons region².

b. Wings beneath divided by a straight black line.

5. *Prepona amphinachus*.

Papilio amphinachus, Fabr. Syst. Ent. p. 457¹.

Morpho amphinache, Hübn. Ex. Schmett. ii. t. 59².

Prepona amphinachus, Bates, Journ. Ent. ii. p. 337³; Butl. & Druce, P. Z. S. 1874, p. 311⁴.

Papilio menander, Cr. Pap. Ex. t. 12. f. A, B⁵.

Prepona menander, Bates, Journ. Ent. ii. p. 336⁶; Butl. & Druce, P. Z. S. 1874, p. 312⁷.

Alis supra *P. demophonti* similibus, subtus ochraceo- aut cinereo-argenteis, linea communi per cellule finem anticarum ad angulum analem posticarum nigra, area basali lineis nigris notatis, dimidio apicali fusciscenti.

♀ subtus dimidio apicali pallidiori.

Hab. MEXICO, Cordova (*Rümelí*); GUATEMALA, Cubilguitz, San Isidro (*Champion*), Retalhuleu (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*^{4 7}); PANAMA, Volcan de Chiriqui (*Champion*), Chiriqui, Veraguas (*Arcé*).—SOUTH AMERICA, from Colombia to South Brazil.

There has been some confusion as to the name of this insect, which has arisen from what appears to us to be the inconstancy of the coloration of its underside. Mr. Bates in the 'Journal of Entomology' notes the points of difference between *P. amphimachus* and that figured by Cramer under the name of *P. menander*⁶. He says the latter has the outer halves of the wings beneath of a much darker hue, and a paler outer border to the fore wing, separated from the dark brown by a line nearly parallel to the margin, while in the true *P. amphimachus* the outer halves of the wings beneath are of a more uniform pale brown colour marked with a dusky line, angular towards the apex. We have before us a large series of specimens of this insect (including Mr. Bates's Amazons insects) ranging from Mexico to South Brazil, and we find very considerable divergence in coloration of their undersides, and this without reference to locality. Between the two extreme forms mentioned we find almost every intermediate, and are thus quite unable to separate them.

This species may be readily distinguished from all others of the genus found within our district by having a dark straight line running from the costa of the primaries through the end of the cell to the anal angle of the secondaries; in the darkest specimens this line is absorbed in the brown colour of the outer half of the wings.

The female is larger than the male, and the underside is usually of a nearly uniform pale ochreous colour, with the central straight line paler.

b. Tuft near the inner margin of the secondaries in male yellow.

6. *Prepona gnorima*. (Tab. XXXI. figg. 7, 8.)

Prepona gnorima, Bates, Journ. Ent. ii. p. 336¹.

Alis fusco-nigris, fascia communi lata ultra cellulam anticarum fere ad angulum posticarum analem cyanea, in anticis intra eam purpureo late suffusa; subtus sericeo-cinereis lineis nigris undulatis variegatis, posticis dimidio distali fusco et griseo lentiginosis, ocellis duobus uno ad angulum analem altero ad angulum apicalem notatis.

♀ mari similis sed major, fascia communi ad costam anticarum extensa et colore purpureo ad basin absente distinguenda.

Hab. GUATEMALA, Polochic valley (*Hague*), central valleys, Chuacus (*F. D. G. & O. S.*); PANAMA, Chiriqui, Calobre (*Arcé*), Lion Hill (*M. Leannan*).—COLOMBIA¹.

Mr. Bates first described this species from Colombian specimens¹, and noted its points of difference from those of its close ally *P. demodice* of Godart.

We have since received several examples of it from Central America, where we trace it as far north as Guatemala.

It differs chiefly from *P. demodice*, of which it is a northern race, in the less expanse

of the violet hue on the upper surface of the wings, this colour being confined to the region within the blue stripe of the fore wings, while in the former species it extends over nearly the whole surface of both wings within and beyond the blue stripe. It also wants the tawny patch on the underside of the primaries which exists in *P. demodice*.

Mr. Bates says that the blue costal spots are also wanting; but to this we attach little importance, as it is not a constant character, since we find them faintly indicated in one of our Colombian, and more fully developed in some of our Guatemalan specimens. Examples from this latter country slightly differ, however, from Colombian in a still less extension of the purple coloration. In the females the purple hue is absent.

Our figure represents a male from the State of Panama.

AGANISTHOS.

Aganisthos, Boisduval & Leconte, Lép. Am. Sept. p. 194 (1833); West. Gen. Diurn. Lep. p. 301.

A single species represents this genus, and is very widely distributed throughout the tropics, from Mexico to Brazil. It is also found in Florida, and in a slightly modified form in some of the Antilles.

Aganisthos orion is an insect of powerful flight, and in this respect resembles the members of *Prepona*.

The wings are entire without projections, the subcostal nervure of the primaries emits two branches before the end of the cell, the third branch running for a long distance parallel to the subcostal before diverging to the costa. The upper discocellular is short, the middle bent in the centre, the lower is absent, but an atrophied spur a little beyond the submedian branch shows its position; the cell of the secondaries is open. The front legs of the male have a stout coxa = $\frac{3}{4}$ femur + trochanter; tibia < femur; tarsus = $\frac{1}{2}$ tibia; terminal joint of the palpi long = $\frac{1}{2}$ middle joint, which is slightly swollen at the distal end. Antennæ with 52 joints, of which 13 form a moderate club. Of the male secondary organs the tegumen has a simple, slightly depressed central spine, and two strong dependent central spines directed outwards; the harpagones are turned upwards at the end, on the inside of which is a strong, upturned spine, and on the ventral edge a recurved notch.

1. *Aganisthos orion*.

Papilio orion, Fabr. Syst. Ent. p. 485¹.

Aganisthos orion, Boisd. & Lec. Lép. Am. Sept. p. 195, t. 52²; Bates, Journ. Ent. ii. p. 335³;

Boisd. Lép. Guat. p. 53⁴; Strecker, Butt. N. Am. p. 146⁵.

Papilio odius, Fabr. Syst. Ent. p. 457⁶.

Aganisthos odius, Butl. & Druce, P. Z. S. 1874, p. 341⁷.

Papilio danaë, Cr. Pap. Ex. t. 84. f. A, B⁸.

Alis fusco-nigris, anticis litura a basi ultra cellulam extendente ad marginem externum obtusum fulva,

macula in costa apicem versus alba, posticis albido marginatis; subtus brunneis linea communi a macula costali anticarum ad angulum analem nigra, fasciis duabus fuscis nigro marginatis ad basin, linea altera arcuata a costa media ad angulum posticarum analem nigra; fascia quoque brunnea arcuata ab angulo posticarum apicali ad angulum analem, extra eam et margine externo albido atomatis.

Hab. FLORIDA⁵?—MEXICO, Cordova (*Rümel*); GUATEMALA, San Isidro (*Champion*); MOTAGUA VALLEY, Pacific slopes (*F. D. G. & O. S.*); COSTA RICA (*Van Patten*⁷), Cache (*Rogers*); PANAMA, Volcan de Chiriqui (*Champion*), Bugaba (*Arcé*), Lion Hill (*McLeannan*).—COLOMBIA to SOUTH BRAZIL; HAITI.

A common and very widely distributed species, varying but little throughout its range. It has a rapid and powerful flight. Mr. Bates says it frequents open sunny places in the neighbourhood of towns³. Haitian specimens have the tawny marking of the primaries broader.

Fabricius described this species twice over in his 'Systema Entomologiæ.' The second name⁶ has been more generally used than the first¹, and we continue the practice. Mr. Butler and others resort to that first given; but both having appeared in the same work, we do not see why question of priority need have been raised.

COEA.

Coea, Hübner, Verz. bek. Schm. p. 48 (1816, partim).

Aganisthos et *Megistanis*, auctt. partim.

The common South-American butterfly *Papilio cadmus* of Cramer has been usually placed either in the genus *Aganisthos* or in *Megistanis*. Prof. Westwood associated it with the latter genus; but Mr. Bates considered that all its essential points of structure agreed with those of the former. A close examination shows us that in reality it does not agree satisfactorily with either, as will be seen from the following comparison:—The cell in both wings is closed by an atrophied lower discocellular nervure as in *Megistanis*, that of *Aganisthos* being open. In the outline of the primaries and in general coloration it agrees with *Aganisthos*, but the secondaries have a caudal appendage and a dentate outer margin as in *Megistanis*; in the pattern of the underside of the wings it differs widely from both these genera, and in this respect recalls to mind several species of the Old-World genus *Charaxes*. In the structure of the male armature it has peculiarities apart from the species with which it has been associated, as will be seen below.

Hübner's name *Coea* seems here applicable as a generic term for this species, having been used for *Papilio cadmus*, and to another butterfly now placed in *Philognoma*.

In *Coea cadmus* the subcostal of the primaries emits two branches before the end of the cell, the third branch lies close to the subcostal for some distance, and then diverges to the margin; both the upper and middle discocellulars are very short, and an atrophied

lower discocellular runs nearly straight across the wing to a little beyond the origin of the second median branch. The secondaries are closed by an atrophied nervure. The coxa of the front leg of the male is stout, $> \frac{1}{2}$ femur + trochanter; tibia nearly = femur; tarsus slender, $> \frac{1}{2}$ tibia; terminal joint of the palpi long, $= \frac{1}{2}$ the middle joint. The secondary male organs have a tegumen with a single, slightly depressed central spine; a single dependent spine hangs below this, which is doubtless formed by the two spines, usually found in allied genera, coalescing; the harpagones are rounded at the extremity, the edge being much lacerated, and on the inner surface is a lobe also with a lacerated edge; on the middle of the ventral edge of the harpagones is a recurved hook.

C. cadmus is the only species of the genus which has a very wide range in Tropical America.

1. *Coea cadmus*.

Papilio cadmus, Cr. Pap. Ex. t. 22. ff. A, B¹.

Aganisthos cadmus, Bates, Journ. Ent. ii. p. 335².

Papilio acheronta, Fabr. Syst. Ent. p. 501³.

Megistanis acheronta, Butl. & Druce, P. Z. S. 1874, p. 341⁴.

Papilio pherecydes, Cr. Pap. Ex. t. 330. ff. A, B⁵.

Alis fuscis, anticarum apicibus late nigris et albo punctatis, litura a basi marginem externum versus extendente rufo-fulva; subtus sericeo-fuscis lineis variis undulatis, nigro præcipue in dimidio basali notatis, maculis albis ad costam anticarum et ad basin posticarum ornatis; margine externo albido atomatis; posticis spatulatis.

Hab. MEXICO, Cordova (*Rimeli*); GUATEMALA, San Gerónimo, Polochic valley (*Hague*), central valleys (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*⁴); PANAMA, Bugaba (*Champion*), Chiriqui, Veraguas (*Arcé*).—COLOMBIA to SOUTH BRAZIL; HAITI.

Described and figured by Cramer under this name, and redescribed and figured later in the same work as *A. pherecydes*. Like the last it is an exceedingly common and widely ranging species. The upperside is pretty constant in its markings, but the underside shows considerable variation, and it was probably from this cause that Cramer was led to consider *A. pherecydes* distinct from *A. cadmus*.

The name *Papilio acheronta* was given it by Fabricius the same year as Cramer's *A. cadmus*. The former has been employed by Kirby and others; but Cramer's name, accompanied, as it is, by a figure, seems to us the best to use.

MEGISTANIS.

Megistanis, Westwood, Gen. Diurn. Lep. p. 311 (1850, ex Boisduval, MS.).

Prof. Westwood first characterized this genus, adopting a name of Boisduval's. The typical species is no doubt *Papilio cadmus* of Cramer, as *Megistanis bæotus*, which is

figured by Hewitson and associated with *P. cadmus*, is spoken of as aberrant. By using *Megistanis* for *M. bæotus* and its strict congeners, and applying Hübner's name *Coea* to *P. cadmus* we avoid some difficulty and confusion which would be caused by shifting titles from one species to another. At the same time we are aware that some lepidopterists would retain *Megistanis* for *Papilio cadmus*, and place *M. bæotus* under a new name, or perhaps *Eribœa*, Hübner. Others might go still further, and sink *Megistanis* altogether as a synonym of *Coea*!

Megistanis, as here understood, contains two or three species, *M. bæotus* and *M. ducalion*, both of which have a nearly conterminous range, extending from the valley of the Amazons westward to Peru and Colombia, and in the case of *M. bæotus* to Bolivia and Nicaragua; the third species is *M. æclus*, Cramer, of which we have no recent information. Its habitat was stated to be Amboina!, and it has been supposed to be a variety of *M. bæotus*.

M. bæotus has the primaries moderately produced at the apex, and the outer margin but slightly concave; the subcostal nervure emits two branches before the end of the cell, the third branch lies close to the subcostal for some distance before diverging to the margin; the upper discocellular is short, and the middle also, and there is an atrophied lower discocellular running straight across the wing to a little beyond the origin of the second median branch; a similar nervure closes the cell of the secondaries. The coxa of the front legs of the male are rather stout, $=\frac{2}{3}$ femur + trochanter; tibia $<$ femur; tarsus single-jointed, $=\frac{1}{2}$ tibia. The terminal joint of the palpi is long, $=$ about $\frac{1}{2}$ the middle joint, which is slightly swollen towards the distal end. The antennæ have 57 joints, the club being slender. The male secondary organs have a tegumen with a blunt central point, and the depending pieces apparently uniting in a strong outwardly directed spine; the harpagones terminate in a hairy lobe, and have two strong diverging spines, starting before the end, and directed outwards and slightly upwards. *Aganisthos orion* has one such spine; in *Coea cadmus* none exist.

1. *Megistanis bæotus*.

Megistanis bæotus, Doubl. & Hew. Gen. Diurn. Lep. t. 48. f. 2¹; Bates, Journ. Ent. ii. p. 339².

Alis nigris, fascia communi lata a vena anticarum mediana fero ad angulum posticarum analem extensa nitide cærulea; anticis maculis duabus, una ad costæ medium, altera ultra cellulam ejusdem coloris, maculis quoque duabus submarginalibus albidis; subtus argenteo-albis undique nigro maculatis, anticis et posticis macula inter ramos medianos lutea, illa in posticis ocellata; posticarum margine externo valde dentato, vena mediana in caudam producta.

♀ adhuc ignota.

Hab. NICARAGUA, Chontales (*Janson*).—COLOMBIA¹; ECUADOR; PERU; BOLIVIA; AMAZONS².

We have a single specimen of this fine species, obtained by Janson at Chontales in

Nicaragua, the sole instance, so far as we know, of its occurrence within our country. It is found in Colombia and Ecuador; and Mr. Bates says it is very abundant on the Upper Amazons, from Ega westward to the slope of the Andes.

The female is unknown.

AGRIAS.

Agrias, Doubleday & Hewitson, P. Z. S. 1848, p. 45; West. Gen. Diurn. Lep. p. 298.

There are eight or nine species now known of this beautiful genus, one of which is found in South Brazil, and one Colombian species extends its range as far north as Chiriqui. The remaining species are all found either in the Amazons valley, the metropolis of the genus, or the eastern and northern slopes of the Andes.

We have not materials for a thorough dissection of *Agrias*; but from such examination as we can make of the whole insect the genus appears to come near *Prepona*, but the primaries are much more rounded, and the general pattern of the under surface of the wings very different. This latter character is of singular interest, inasmuch as some species closely resemble species of *Callithea* or of *Catagramma* found in the same district. Like *Prepona* the males of *Agrias* have a pencil of hair near middle of the inner margin of the secondaries.

1. *Agrias ædon*. (Tab. XXXI. figg. 5, 6 ♀.)

Agrias ædon, Hew. P. Z. S. 1848, p. 46, t. 1¹; Ex. Butt. *Agrias* & *Siderone*, f. 2²; Doubl. & Hew. Gen. Diurn. Lep. p. 298, t. 47³; Godm. & Salv. Trans. Ent. Soc. 1880, p. 124⁴.

Alis fusco-nigris, anticis litura elongata basali usque ad angulum analem extensa saturate punicea; posticis litura discali læte purpureo-cyanea; subtus litura punicea quam ea paginæ superioris pallidiore, anticarum apice pallide fusca maculis duabus in cellulam linea ad finem ejus et duabus obliquis ultra eam brunneis; posticis fuscis, dimidio proximali brunneo maculato, fasciis tribus margini externo subparallelis fuscis, ocellis septem submarginalibus cyaneis nigro circumdatis et albo pupillatis, ocello ad angulum analem bipupillato.

♀ mari similis, sed alis puniceo tantum ornatis, posticis omnino fuscis.

Hab. PANAMA, Volcan de Chiriqui (*Arcé*).—SOUTH AMERICA¹, Colombia^{2 3 4}.

We have a single female specimen of this species, which was taken by Arcé at a considerable elevation in the Volcano of Chiriqui, where he shot it, as it did not come within reach of his net. The wings, as might be supposed, are a good deal damaged by this rough mode of capture. Dr. Staudinger has, we believe, a specimen in his collection from the same country.

Agrias ædon was originally described by Hewitson from a male specimen taken by Mr. Empson somewhere in South America¹. It has since been received from various points of Colombia, where also Mr. Simons found it at Manaure, and sent us two examples, a much-worn male and a female⁴.

We have described a perfect Colombian male in our collection, the characters of the female being taken from the Chiriqui specimen alluded to above, which is also figured.

SMYRNA.

Smyrna, Hübner, Samml. ex. Schmett. ii. t. 65; Westw. Gen. Diurn. Lep. p. 297.

There are two apparently closely allied species of this genus, both of which occur throughout our region; but whereas *S. blomfieldia* is also found in Western South America as far as Paraguay, *S. karwinskii* does not extend its range beyond Colombia. These two species are very much alike in all the details of the coloration of their wings; but besides a difference in the shape of the anal angle of the secondaries, the secondary male sexual organs are so distinct that there can be no doubt as to the validity of the two species.

In *S. blomfieldia* the subcostal emits two branches before end of the cell, and the third branch diverges at once on leaving the subcostal. The upper discocellular is short and transverse, the second rounded into the lower radial; an atrophied lower discocellular crosses the cell transversely to a point a little beyond the origin of the second median branch. A similar nervule closes the cell of the secondaries. The front legs of the male have a stout coxa = $\frac{2}{3}$ femur + trochanter; tibia = femur; tarsus single-jointed, = $\frac{2}{3}$ tibia; the front legs of *S. karwinskii* have two tarsal joints; terminal joint of the palpi long and rather slender, = $\frac{1}{2}$ the middle joint, which is rather swollen towards the distal end. The antennæ have 52 joints, and terminate in a moderate club. The tegumen has a strong central spine, which terminates rather abruptly in a decurved point; the harpagones are simple lobes, terminating in a blunt point. In *S. karwinskii* the tegumen has two recurved hooks dependent from its edges, but these do not approach one another in the middle line; the harpagones have a long, slightly incurved spine arising about the middle of the dorsal edge, inside of which is another short spine.

1. *Smyrna blomfieldia*.

Papilio blomfieldia, Fabr. Spec. Ins. ii. p. 84¹.

Smyrna blomfieldii, Hübn. Samml. ex. Schmett. ii. t. 65²; Butl. & Druce, P. Z. S. 1874, p. 348³.

Papilio proserpina, Fabr. Ent. Syst. iii. p. 228.

Nymphalis bella, Godart, Enc. Méth. ix. p. 375⁵.

Alis fulvis ad basin saturatioribus, anticis triente apicali nigris maculis tribus subapicalibus sordide albis; posticis linea submarginali nigra ad angulum apicalem multo latiore, angulo anali leviter producto; subtus anticis fascia transversa lata ochraceo-flava, extra eam nigris, basi et apice nigro et albo variegatis; posticis marmoratis ocellis submarginalibus quatuor, duobus mediis cæcis.

♀ alis multo brunnescentioribus, anticis fascia transversa ochraceo-flavida bisectis.

Hab. MEXICO, Cordova (*Rümeli*); BRITISH HONDURAS, Sarstoon river (*Blancaneaux*); GUATEMALA, Cerro Zunil, San Isidro (*Champion*), Polochic river (*Hague*), Dueñas, Chuacus, Retalhuleu (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*³); PANAMA, Bugaba (*Champion*), Veraguas (*Arcé*).—SOUTH AMERICA, from Colombia to Paraguay.

An exceedingly common insect throughout the whole of Central America, frequenting open places and the neighbourhood of houses, where they may be seen clinging to white-washed walls exposed to the sun.

In South America it extends to Paraguay, but it does not, so far as we know, spread eastwards through the valley of the Amazons or to Guiana.

2. *Smyrna karwinskii*.

Smyrna karwinskii, Hübn. Samml. ex. Schmett. iii. t.—¹; Doubl. & Hew. Gen. Diurn. Lep. t. 46. f. 2².

S. blomfieldi similis, sed posticarum angulo anali caudato, et linea submarginali præter ad angulum apicalem absente.

Hab. MEXICO ^{1 2}, Jalapa (*Höge*), Cordova (*Rümeli*); GUATEMALA, San Gerónimo (*Champion*). Motagua valley, central valleys, Dueñas (*F. D. G. & O. S.*); PANAMA, Volcan de Chiriqui (*Champion*).—COLOMBIA.

This species scarcely differs from the last, except in the absence of the short tail of the secondaries, and in the secondary male sexual parts described above. Its distribution, however, is somewhat different. The two species are found together throughout Central America. Thence we trace it into Colombia, but, so far as we know, it does not extend further south.

PYCINA.

Pycina, Westwood, Gen. Diurn. Lep. p. 305 (1850).

This genus has long been known from a single species from Colombia and Ecuador, described under the name of *P. zamba*. The species described below is a slight local modification of the previously known form. *Pycina* has a general colour-resemblance to *Smyrna*, but may readily be distinguished by its more elongated primaries and by the undulating costa of the secondaries. The second branch of the subcostal of the primaries is emitted close to the end of the cell; the upper discocellular is short and directed rather backwards, the middle is long and curved, and the lower closes the cell obliquely and joins the median some way beyond the origin of the second branch; the submedian is slightly swollen near the base; an atrophied lower discocellular closes the cell of the secondaries. The eyes are densely hairy; the terminal joint of the palpi is moderately long and tapering, the middle joint is long and of nearly uniform width throughout; the front legs of the male are very hairy, and have a comparatively short and slender coxa; the femur is long, and with the trochanter = 2 coxa; tibia = femur + trochanter; tarsus (single-jointed) = $\frac{2}{3}$ tibia. The tegumen of the male secondary organs has a strong median spine, which is decurved at the point, and depending from it are two short strong spines united at their bases, and slightly inclined towards one another at their tips; the harpagones are simple lobes, slightly constricted towards the tip, where there is a short recurved hook.

1. *Pycina zelys*, sp. n.

Pycina zamba, Butl. & Druce, P. Z. S. 1874, p. 341¹.

Alis rufo-brunneis, posticis ad angulum analem saturationibus, anticis bitriente apicali nigris, fascia maculosa arcuata a costa ad marginem externum extensa et macula subapicali costam fere attingente albis, posticarum costa late nigricante; subtus anticis nigris basi fulvis maculis albis sicut in pagina superiore, apice et posticis omnino marmoratis, harum costæ dimidio basali albicante, posticis ocellis quinque submarginalibus ornatis, illo inter ramos medianos maximo.

Obs. *P. zambæ* affinis, sed anticis minus rufo-brunneis, marginis interni dimidio haud superante.

Hab. COSTA RICA (*Van Patten*¹), Rio Sucio (*Rogers*); PANAMA, Volcan de Chiriqui (*Champion*).

This species is closely allied to *Pycina zamba*, but differs in having the fulvous of the base of the primaries more restricted and somewhat darker in colour. The true *P. zamba* is a scarce species, being found in Colombia, Ecuador, and Venezuela; *P. zelys* seems equally rare in Costa Rica and Panama, whence we have seen but few specimens.

SIDERONE.

Siderone, Hübner, Samml. ex. Schmett. ii. t. 56; Westw. Gen. Diurn. Lep. p. 320.

Siderone comprises several species, the limits of which are not very definite, owing to the amount of variation to which they are subject. All, however, are strictly tropical insects, and the genus spreads from Southern Mexico to South Brazil, and is found in some of the West-Indian Islands. Within our limits we recognize five species.

Though greatly resembling *Anæa* in its general construction, the neuration of the primaries is strictly normal in character, and does not present any of the running together of the subcostal branches with the costal, which forms so curious a feature in *Anæa* and its immediate allies *Hypna* and *Protogonius*.

In *Siderone ide* the subcostal of the secondaries emits two branches before the end of the cell, and the third and fourth not far apart, some way beyond it. The upper and middle discocellulars are both present, but short; the lower discocellular meets the median some way beyond the origin of the second branch. The front legs of the male have a stout coxa = $\frac{3}{4}$ femur + trochanter; tibia < femur; tarsus = $\frac{2}{3}$ tibia; the terminal joint of the palpi is short, = about $\frac{1}{6}$ the middle joint. The antennæ have about 52 joints, and terminate in a moderate club. The secondary male organs have a strong tegumen terminating in a decurved spine, below which are two short spines; the harpagones have a pointed end, and are covered towards the extremity with long strong hairs.

a. Wings of both sexes testaceous or tawny.

1. *Siderone isidora*.

Papilio isidora, Cr. Pap. Ex. t. 235. f. A, B, E, F¹.

Siderone isidora, Bates, Journ. Ent. ii. p. 343².

Papilio itys, Cr. Pap. Ex. t. 119. f. F, G³.

Siderone itys, Doubl. & Hew. Gen. Diurn. Lep. t. 53. f. 3⁴.

Alis anticis falcatis, apice acuto, margine interno ad angulum analem excavato, posticis ad angulum analem lobatis; alis anticis bifenestratis testaceis, apice et macula ad cellulæ finem fusco-nigris, posticis quoque testaceis linea submarginali indistincta fusca; subtus pallidioribus glauce variegatis, linea communi fusca ab anticarum apice ad angulum posticarum analem.

♀ mari similis, sed alis magis retundatis et pallidioribus, anticis fascia transversa lata ultra cellulam fulva.

Hab. BRITISH HONDURAS, Rio Sarstoon (*Blancaneaux*); GUATEMALA, Yzabal (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt*); COSTA RICA, Irazu (*Rogers*).—COLOMBIA to AMAZONS VALLEY² and PARAGUAY.

This widely distributed species has a rather restricted range in our region. In Guatemala we only know it from a single male specimen taken by ourselves at Yzabal in 1861. From the same neighbourhood M. Blancaneaux has sent us an example from the valley of the Sarstoon, the frontier river between Guatemala and British Honduras. In Nicaragua it appears to be tolerably abundant, but, with the exception of a single Costa-Rican example, we have not met with it again north of Colombia. Mr. Bates found *S. isidora* distributed throughout the Amazons region in thinned parts of the forest; and he further remarks that both sexes appear to be very unstable in the form of the wings and in markings.

This species may be known from the next by the black tips to the primaries, and by the females usually having a tawny band across these wings. If this band is absent the wings are pale testaceous and not tawny, as is the case in *S. ellops*.

2. *Siderone ellops*.

Siderone ellops, Ménétr. En. Corp. An. Mus. Petr. i. p. 88, t. 3. f. 1¹.

Siderone isidora, Godm. & Salv. Trans. Ent. Soc. 1880, p. 124² (nec Cramer).

S. isidoræ affinis, sed plerumque minor, maris alis pallidioribus et anticarum apicibus vix fusco tinctis.

♀ anticis fulvis haud fasciatis, posticis ad marginem externum paulo saturatioribus.

Hab. GUATEMALA, Polochic valley and San Gerónimo (*Hague*), Cubilguitz (*Champion*); NICARAGUA¹; PANAMA, David (*Champion*), Calobre (*Arcé*).—COLOMBIA².

This is a small paler form of the more widely distributed *S. isidora*, and is tolerably common in Central America and in the extreme north of Colombia. It was first described by Ménétriés from Nicaragua specimens; and though we have none actually from that country, we have no difficulty in recognizing the species in specimens from Guatemala and the State of Panama. The differences from *S. isidora* consist chiefly in the paler colour of the males and the nearly total absence of the black tips to the primaries; the secondaries are of a nearly uniform tawny colour, and the primaries are not banded, as is usually the case in the allied species.

Mr. Champion captured several specimens of both sexes near the town of David,

where they resorted to a low hill, called San Cristobal, which is clothed on its slopes with thin forest.

b. Wings of both sexes black with crimson bands.

3. *Siderone ide*.

Siderone ide, Hübn. Samml. ex. Schmett. ii. t. 56¹.

Siderone thebais, Feld. Wien. ent. Mon. vi. p. 422²; Reise d. Nov. Lep. t. 60. f. 6, 7³; Butl. & Druce, P. Z. S. 1874, p. 340⁴.

Alis anticis extus rotundatis, posticarum angulo anali producto, omnibus fusco-nigris; anticis triente basali et fascia lata obliqua ultra cellulam coccineis, punctis duobus ad apicem albis, posticis macula apud costæ medium interdum in fasciam producta coccinea, maculis indistinctis submarginalibus præcipue ad angulum analem canis; subtus læte velutino-rufobrunneis maculis obscurioribus irroratis, linea communi ab angulo anticarum apicali ad angulum posticarum analem, plaga magna subtriangulari apice costam posticarum attingente et margine externo dimidio anali glauco rufescentibus, anticarum apice nebuloso cano maculato, palpis subtus et pectore canescentibus.

Hab. MEXICO, Valladolid in Yucatan (*Gaumer*); GUATEMALA, Polochic valley (*Hague*), Las Mercedes (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*⁴); PANAMA, David (*Champion*), Chitra, Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—COLOMBIA^{2 3} to SOUTH BRAZIL.

The extreme forms of this species are represented by *Siderone ide*, in which the red of the secondaries is reduced to a costal spot, and by *S. thebais*, in which the red constitutes a distinct band running towards the anal angle.

The *S. ide* type is found prevalent in Guatemala, Nicaragua, and Costa Rica; in the neighbourhood of Panama the *S. thebais* form is found, but at Chiriqui the two pass completely the one into the other by insensible steps, so that any certain definition between them fails.

Outside our limits we find *S. ide* in Brazil, and *S. thebais* in Colombia, and another form appears in *S. marthesia* in Guiana and the valley of the Amazons. This latter insect is distinguished in its typical form by the red of the primaries blending into one continuous patch; but there is evidence in the specimens before us that this character is not very stable. The typical females, moreover, of *S. marthesia* have the red of the primaries replaced by tawny. This character, too, appears to fail in more western examples, as we have insects from Ecuador red like the males. In Cuba and Haiti a *Siderone* occurs which is probably not really separable from *S. ide*, but our series is hardly sufficient to settle the point. The females in this form have a dull reddish border to the secondaries not observable in continental specimens, except at Panama, and these, again, have more red on the secondaries. There are two names available for this Antillean *Siderone*. It is evidently the *Papilio nobilis nemesis* of Illiger described from Haitian specimens, and it is also the *Nymphalis rogerii* of Godart, figured by Lucas in his 'Lépidoptères exotiques.'

Should it be found necessary to unite all these forms under one specific name,

as seems to us not at all improbable, Cramer's title *S. marthesia* will have to be adopted.

Siderone ide, as we prefer to call this butterfly for the present, is rare in Guatemala. All we saw of it was a wing which we picked up amongst the Indian ruins of Copan. Mr. Hague subsequently sent us specimens from the valley of the Polochic; and Mr. Champion also found it. To the last-named collector we are indebted for a good series of examples captured on the top of a small hill in the vicinity of David, in the State of Panama. Here they resorted to bushes during the hottest part of the day; on being disturbed they flew to the higher trees on the slopes of the hill, where they settled on the trunks.

4. *Siderone syntychē*.

Siderone syntychē, Hew. Ex. Butt. *Agrias* and *Siderone*, f. 4, 5¹.

S. ide similis, sed anticis plaga magna basali coccinea tantum notata, fascia ultra cellulam nulla, parte alarum obscura cyaneo late suffusa distinguenda.

Hab. MEXICO¹; GUATEMALA.

This beautiful species was described and figured by Hewitson from a Mexican specimen formerly in the collection of the late W. Wilson Saunders, and we have had no further tidings of the species until quite recently Dr. Staudinger submitted to us a damaged specimen from Guatemala, showing the extension of its range into that country, though none of our other correspondents and collectors have as yet met with it.

Hewitson supposed that *S. syntychē* was probably the male of *S. marpesia*; but in this opinion he was evidently mistaken, the true *S. marpesia* having much more red on the primaries, and none of the brilliant blue which so distinguishes the present species, and which separates it at once from all the allied forms, except the following, which probably represents it in the southern parts of our region.

5. *Siderone polymela*, sp. n.

S. syntychē affinis et anticis eodem modo cyaneo suffusis, anticarum vero plaga basali coccinea ad angulum analem multo magis producta distinguenda.

Hab. PANAMA, Bugaba (*Champion*).

Mr. Champion during his recent expedition captured a single male specimen of this species, which is closely allied to *S. syntychē*, and has the same beautiful blue gloss on the dark portions of the primaries; the red band on these wings is extended towards the anal angle, and not restricted to the base of the wing as in *S. syntychē*.

Other allied species are *S. vulcanus* and *S. mars*, but in both of these the blue colour alluded to above is either wholly absent or can only be traced in a certain incidence of light. The red patch, too, of both these species is rather differently shaped.

ANÆA.

Anæa, Hübner, Verz. bek. Schm. p. 48 (1816).

Paphia, Fabr. in Ill. Mag. f. Insectk. vi. p. 282 (nec Lamarck); Westw. Gen. Diurn. Lep. p. 317.

Anæa is one of the largest as well as one of the most characteristic of Neotropical Nymphalinae, and it probably contains not less than 100 species, so far as our present knowledge extends. All of these, with the single exception of *Anæa ops*, which occurs on the northern side of our frontier, are found within the Neotropical Region, no less than thirty-five occurring within our limits.

One of the most remarkable features in this genus is in the relative positions of the costal nervure of the primaries to the subcostal and its branches, the branches of the subcostal coalescing with the costal in various ways, independent slips passing between the costal and the margin. Prof. Westwood, with his usual care, has drawn attention to this feature; but the question which he raises of the relationship of these slips to the subcostal branches which they, to some extent, supersede, we are still unable to explain satisfactorily. Proceeding along the costa in most butterflies from the base of the primaries the first nervure that reaches the margin is the costal, then come the subcostal branches in their order (first, second, third, fourth), and then the subcostal itself, or, as it is sometimes reckoned, its fifth branch. In *Anæa* the subcostal branches all unite with costal, except the fourth, and there are two or three slips from the costal to the margin; these do not start from opposite the subcostal branches, but usually between them. It seems probable that the first of these slips is the termination of the costal, that between it and the second slip and the apparent extension of the subcostal is in reality the continuation of the first subcostal branch which passes abruptly to the costa as the second slip, the second subcostal does the same, and so on. If this be correct, the costal, which apparently runs the whole length of the wing to the apex, does not really do so, but for a considerable part of its length it is made up of the costal branches, which unite for some distance to separate again. Two other points require notice: in some species the first subcostal branch is atrophied, and does not reach the costal at all; in others the third subcostal branch is itself branched, the upper limb reaching the costal, the lower running free to the margin. In this instance there are but three subcostal branches, and it is reasonable to suppose that the third is the third and fourth united till the subbranch separates. Against this supposed arrangement of the nervures is the fact that the costal presents no indication that it is thus built up, but it runs in a single tube uninterruptedly throughout its length to the apex, gradually diminishing in size without reference to the nervules it receives and emits.

The arrangement of the nervures in the neighbourhood of the costa throughout the genus all partake of this tendency to ankylosis; but the variations are so many and so little in accordance with other characters, that we hesitate to adopt them for the purpose of dividing the genus into groups; but taking these characters in a primary

sense, so far as some of the Central-American species are concerned, we get the following results:—

- A. Three slips from costal to costa; first and second subcostal branches uniting with costal; third branch divided, one slip uniting with the costal, the other passing to the outer margin: *glycerium*, *nobilis*, *ryphea*, *pithyusa*, *electra*.
- B. Two slips from the costal to the costa; first subcostal branch atrophied, second and third united to costal, fourth free: *aidea*.
- C. Two slips from costal to costa; first and second subcostal branches united to costal; third divided, one slip uniting with costal, the other passing to the outer margin: *dia*.
- D. Two slips from costal to costa; first subcostal branch absent; second united to costal; third divided, one slip joining costal, the other passing to the outer margin: *echemus*.
- E. One slip from costal to costa; first subcostal atrophied; second and third united to costal; third divided, one slip joining costal, the other passing to the outer margin: *xenocles*.

In all species of *Anæa* there is a lower discocellular closing the cell of the primaries. This joins the median some way beyond the origin of the second branch; an evanescent nervure also closes the cell of the secondaries. The front legs of the male (*A. glycerium*) have a coxa = $\frac{2}{3}$ femur + trochanter, tibia = $\frac{3}{4}$ femur; tarsus single-jointed, = $\frac{1}{2}$ tibia. In other species of the genus there is some variation as to the relative strength of the joints, but the general proportions seem to be maintained. The terminal joint of the palpi is short in *A. glycerium* and *A. dia*, and in most species about = $\frac{1}{3}$ the middle joint; in *A. electra* about = $\frac{1}{5}$; the middle joint is of nearly uniform width throughout and rather stout. The antennæ have 39 joints (*A. glycerium*), 54 (*A. dia*), 41 (*A. nobilis*), 43 (*A. electra*), 38 (*A. ryphea*), 47 (*A. xenocles*), 41 (*A. pithyusa*), 43 (*A. aidea*).

The structure of the male secondary organs is tolerably uniform. In *A. glycerium* the tegumen terminates in a slightly depressed spine, and there is a pair of dependent strong outwardly directed spines below it; the harpagones are simple lobes with a short spine slightly bent inwards at the end. In *A. dia* there is a dense pencil of hair-like scales at the end of the harpagones; in *A. electra* this pencil is present, but not the terminal spine. Of the species examined, *A. aidea* departs furthest from *A. glycerium* in respect to these organs; the two spines below the tegumen, and dependent from it, are long and turned upwards, and their ends are cleft into two points instead of remaining a single one; the harpagones are longer and more curved, and not so elliptical in outline.

a. Body stout, anal angle of secondaries not produced as a lobe.

a'. Wings more or less rufous at the base.

A. glycerium group.

1. *Anæa glycerium*.

Paphia glycerium, Doubl. & Hew. Gen. Diurn. Lep. p. 319, t. 50. f. 1¹; Butl. & Druce, P. Z. S. 1874, p. 341²; Druce, P. Z. S. 1877, p. 636³.

Alis ferrugineo-fulvis, anticarum apice fusco-nigro, margine interno valde irregulari, margine externo valde sinuato, posticis caudatis; subtus testaceis ferrugineo-fusco undique irroratis, anticis linea transversa fere bisectis et plaga magna ad marginem externum ferrugineis, posticis lineis duabus transfasciatis, una ultra cellulam altera submarginali, maculis parvis submarginalibus albis.

♀ mari similis, sed alis multo pallidioribus et colore fusco ad apicem anticarum minus obvio.

Hab. MEXICO¹, Cordova (*Rümel*), Valladolid in Yucatan (*Gaumer*); GUATEMALA, Central valleys and Polochic valley (*F. D. G. & O. S.*), Choctum (*Hague*), Telemán and Las Mercedes (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*), San Francisco (*Rogers*); PANAMA, Bugaba and Volcan de Chiriqui (*Champion*), Calobre (*Arcé*).—SOUTH AMERICA, Colombia, Venezuela, E. Brazil; JAMAICA.

This is perhaps the commonest species of *Anæa* in Mexico and Central America, and we have received specimens from all parts, from Southern Mexico to Panama. In South America it appears to be not nearly so abundant; but we trace it to Pernambuco in Brazil, where the late W. A. Forbes found it. His specimens are the smallest we have seen, but evidently belong to the Mexican species.

In Central America this species frequents thin forest in the hotter parts of the country.

One of the chief characteristics of *A. glycerium* is the sinuous outer margin to the primaries, and in this respect it has no near allies. In its general colour it resembles *A. ryphea*.

A. titan group.

2. *Anæa titan*.

Nymphalis titan, Feld. Reise d. Nov. Lep. p. 447, t. 60. f. 4¹.

Paphia titan, Butl. & Druce, P. Z. S. 1874, p. 340²; Druce, P. Z. S. 1877, p. 636³.

Alis purpureo-rufescentibus, violaceo suffusis fusco-nigro indistincte limbatis, anticis triente apicali nigra maculam rufescentem includente, linea sinuosa submarginali in posticis continuata nigra; posticis caudatis; subtus alis ferrugineis fusco et albedo undique irroratis, area ad anticarum marginem externum fere unicolori, posticis linea obscura transversa bisectis, extra eam altera linea latiore, punctis albis nigro pupillatis submarginalibus ad angulum analem.

Hab. COSTA RICA (*Van Patten*²).—COLOMBIA¹.

A single male specimen in Van Patten's Costa-Rica collection is our sole authority for including this Colombian species in our fauna. This possibly may have come from another source.

A. titan is one of Lindig's discoveries in Colombia, and was described by Dr. Felder¹ in 'Voyage of the Novara.'

Mr. Druce remarks that the Costa-Rican example is darker and larger than others from Colombia; but on these points we see no difference when the specimen is compared with a typical one received from Dr. Felder himself.

A. aidea group.

3. *Anæa aidea*.

Nymphalis (*Thymetes*?) *aidea*, Guér. Icon. Règne An. texte, p. 478¹.

Paphia aidea, Druce, P. Z. S. 1877, p. 633².

Alis testaceis fusco marginatis, anticarum cellulæ fine et linea angusta sinuosa a costa margini externo subparallela in posticarum apicem extensa fuscis; subtus sordide cineris fusco irroratis, anticis ad marginem internum ferrugineis.

♀ mari similis, sed major notatione alarum fusca latiore multo magis distincta.

Hab. MEXICO, Milpas in Durango (*Forrer*), Cordova (*Rümeli*), Oaxaca (*Fenochio*), Campeachy (*Perbosc*¹), Valladolid in Yucatan (*Gaumer*); GUATEMALA, Chisoy valley (*Hague*), Central valleys and Polochic valley (*F. D. G. & O. S.*), San Gerónimo and Teleman (*Champion*); NICARAGUA, Chontales (*Belt*).

This species was described by Guérin from a specimen taken on board ship in the Bay of Campeachy¹.

It has some close allies in the West-Indian Islands, and in Texas a species (*A. ops*, Druce) occurs which probably spreads across the Rio Grande into our borders; but we have no evidence that this is the case.

In Mexico and Guatemala *A. aidea* is a common species, but we have not traced it southwards beyond Nicaragua.

A. chrysophana group.

4. *Anæa chrysophana*.

Paphia chrysophana, Bates, Ent. Monthl. Mag. iii. p. 152¹; Druce, P. Z. S. 1877, p. 634².

Nymphalis pyrrhothea, Feld. Reise d. Nov. Lep. p. 447, t. 60. f. 3³.

Paphia helie, Butl. & Druce, P. Z. S. 1874, p. 341⁴.

Alis intus saturate fulvis, extus fuscis et omnino purpureo læte suffusis; anticis acutis, posticis caudatis macula ad apicem anticarum elliptica fulva; subtus sordide ferrugineis undique fusco irroratis, posticis punctis nigris (intus caeruleo-albidis) apicem versus ornatis.

♀ fulvalis, anticis triente apicali nigra plaga magna discali, altera subapicali ochraceis; subtus sordide ochraceis, undique fusco maculatis et irroratis.

Hab. COSTA RICA (*Van Patten*⁴); PANAMA, Veraguas (*Arcé*^{1 2}), Line of Railway (*McLeannan*^{1 2}).—COLOMBIA^{2 3}; PERU².

Mr. Bates described this species from specimens sent to us from the State of Panama¹, and soon afterwards it was described and figured by Felder³. The insect called *P. helie* by Messrs. Butler and Druce⁴ also belongs here, as the specimens testify.

Though obviously allied to *A. ryphea* this species may readily be distinguished by its smaller size and by the beautiful purple sheen which pervades the whole of the upper surface of the wings. In this respect it is like *A. halice* of Brazil, from which the coloration of the female easily renders it separable. The female differs from those of all the allied species in having a large ochraceous patch on the primaries and a spot of the same colour on the apical angle.

A. chrysophana is apparently a rare species, and no specimens have been sent us from the district of Chiriqui. Our Peruvian example was taken by Mr. E. Bartlett at Yurimaguas, near the foot of the Andes on the eastern side.

5. *Anæa ryphea*.

Papilio ryphea, Cr. Pap. Ex. t. 48. f. G. H⁴.

Paphia ryphea, Butl. & Druce, P. Z. S. 1874, p. 341²; Druce, P. Z. S. 1877, p. 634¹.

Alis saturate ferrugineo-fulvis, anticarum apicibus nigris maculam ellipticam fulvam includentibus; posticis caudatis macula indistincta pallida ad angulum analem; subtus ferrugineis undique fusco irroratis atomisque albidis sparsis, posticis linea obscura bisectis lituraque subapicali lata notatis.

♀ mari similis, sed major et alis pallidioribus macula ad anticarum apicem et aliis duabus ad costæ medium ochraceis; subtus sordide ochraceis et maculis omnibus majoribus.

Hab. MEXICO, Cordova (*Rümeli*), Oaxaca (*Fenochio*³); GUATEMALA, Polochic valley, Choctum (*Hague*); NICARAGUA, Chontales (*Belt*³, *Janson*); COSTA RICA (*Van Patten*²), San Francisco (*Rogers*), Orosi (*Kramer*); PANAMA, Bugaba (*Champion*), Veraguas (*Arcé*).—GUIANA¹; VENEZUELA; ECUADOR; PERU; BOLIVIA.

This seems to be the species figured by Cramer from a Surinam specimen¹. It is rather a redder insect than *A. phidile*, and appendages to the secondaries are always present.

A. ryphea has a very wide range, being found throughout our region from Southern Mexico to Panama, and thence spreads over a large portion of Tropical South America. We can trace no difference between Mexican and Bolivian specimens.

6. *Anæa phidile*.

Paphia phidile, Geyer in Hübn. Zutr. ex. Schm. fünftes Hund. p. 27, f. 905, 906¹; Bates, Journ. Ent. ii. p. 342²; Druce, P. Z. S. 1877, p. 635³.

A. rypheæ valde similis, sed alis posticis saturationibus ecaudatis, subtus linea mediana posticarum valde sinuata haud recta distinguenda.

Hab. COSTA RICA (*Van Patten*³?); PANAMA, Calobre (*Arcé*³), Line of Railway (*M'Leannan*).—SOUTH AMERICA, Colombia to Brazil.

The most obvious distinction between this species and *A. ryphea* is the absence in the males of the caudal appendages, which, however, in some specimens are just indicated by a notch. In addition to this the secondaries are more darkly coloured, and the median line beneath is waved instead of straight.

In some specimens there is a cluster of large white spots across the secondaries beneath, in others there are a number of large blackish spots at the base of the same wings.

With a very similar range in the continent of South America to *A. ryphea*, this species does not extend beyond the State of Panama; for though Mr. Druce records it from Costa Rica³, we have no specimen from there.

The origin of Geyer's type was not known.

A. nobilis group.

7. *Anæa nobilis*. (Tab. XXXV. figg. 1, 2 ♂, 3 ♀.)

Paphia nobilis, Bates, Ent. Monthl. Mag. i. p. 162¹; Druce, P. Z. S. 1877, p. 636².

Alis sanguineo-rufis, dimidio anticearum distali fusco-nigro, maculis sanguineis notatis; posticis caudatis saturatioribus parte distali nigricantioribus; subtus obscure ferrugineis undique irroratis, posticis linea transversa bisectis altera latiore extra eam et ocellis submarginalibus ad angulum analem notatis.

♀ major, alis omnino fusciscentioribus ad basin tantum sanguinolentis, serie duplici macularum ochracearum margini anticearum subparallela, posticis parte distali ochraceo irroratis et punctis submarginalibus nigris notatis; subtus sordide ochraceis maculis et lineis omnibus magis distinctis.

Hab. GUATEMALA, San Gerónimo (*F. D. G. & O. S.*¹, *Champion*).

This fine species is, so far as we know, restricted to the hills surrounding the east side of the plain of Salamá, where the village of San Gerónimo is situated. It was here that we discovered it in 1862, and where Mr. Hague subsequently obtained specimens for us. Mr. Champion, too, met with it in the same district during his recent sojourn in Guatemala.

It frequents the mountain-streams, flying rapidly close to the water. Some specimens were caught on dung, others on wet sand.

A. nobilis has no near allies that we know of; but it is perhaps best associated with the red species, which it resembles on the underside.

b'. Wings bluish black or purple, more or less blue or green at the base.

a''. Secondaries tailed in both sexes.

a'''. Inner margin of primaries deeply falcate at the distal end.

A. morvus group.

8. *Anæa morta*. (Tab. XXXII. figg. 11, 12 ♀; Tab. XXXIV. figg. 5, 6 ♂.)

Paphia morta, Druce, P. Z. S. 1877, p. 645¹.

Paphia onophis, Bdv. Léop. Guat. p. 50² (nec Felder).

Paphia iphis, Butl. & Druce, P. Z. S. 1874, p. 341³ (nec Latreille); Druce, P. Z. S. 1877, p. 641⁴;

Godm. & Salv. Trans. Ent. Soc. 1880, p. 124⁵.

Paphia morvus, Druce, P. Z. S. 1877, p. 639⁶ (nec Fabricius).

Alis cyaneo-nigris, basi cyanescentibus, anticis maculis cyaneis obsoletis ad angulum apicalem; subtus sericeo-rufescenti-fuscis grisco irroratis, margine anticarum externo grisescentibus; posticis fascia obscura discali valde irregulari, altera submarginali, punctisque submarginalibus nigris ornatis.

♀ major colore ad alarum basin dilutiore, maculis anticarum subapicalibus magis distinctis et ab apice magis distantibus, subtus alis omnino pallidioribus et maculis fuscis valde irregulariter notatis.

Hab. BRITISH HONDURAS, Corosal (*Roe*¹); GUATEMALA^{2 4}, San Gerónimo (*Champion*), Motagua valley (*F. D. G. & O. S.*), Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*); COSTA RICA⁴ (*Van Patten*³); PANAMA⁴, Chiriqui (*Ribbe*⁶, *Arcé*, *Champion*), Line of Railway (*M'Leannan*).—N. COLOMBIA⁵.

The greatest confusion has existed respecting this species, owing chiefly to the misapplication of the name *Nymphalis iphis* of Latreille. This, we are now strongly of opinion, confirmed by specimens so named from Mr. Bates's collection, is synonymous with *Paphia mæris* of Felder, and applies to quite a distinct species from that named *P. iphis* by Dr. Felder in our collection, and from the one so called in Mr. Druce's monograph.

With the true *P. iphis* (= *P. mæris*), therefore, this species has no relationship. It is in fact so near to *P. morvus* of Fabricius that we have some hesitation in separating it. The chief difference, if not the only really stable one, is in the general colour of the female, which is devoid of any of the purple tinge seen in that sex of *P. morvus*.

Regarding the name *P. onophis* of Boisduval, we know, from the types having been submitted to us by M. Charles Oberthür, that they belong to this insect; but unfortunately Dr. Felder has previously used this name for another species, so that it is not available here.

The title we adopt was given by Mr. Druce to a single female specimen in our collection from British Honduras. This differs to some extent, especially on the under-side of the wings, from other Central-American examples of the same sex. The wings beneath are rather yellower and the markings are few and obscure; above the blue of the base of the hind wings is rather more restricted. In view of the great diversity in the colour of the wings of specimens of many species of *Anæa* we do not think these differences are of specific value.

A. morta is found throughout Central America and in Northern Colombia, where Mr. Simons obtained it at Manaure, at the foot of the Sierra Nevada of Santa Marta. His specimens are rather dark, and beneath are rather richer ferruginous than our Guatemalan examples.

9. *Anæa œnomais*.

Paphia œnomais, Bdv. Lép. Guat. p. 51¹.

A. mortæ affinisissima, sed minor, alis anticis magis falcatis, alarum basi viridescentiore.

♀ quoque minor et alis purpurascente tinctis.

Hab. GUATEMALA¹, Polochic valley (*Hague*), Cubilguitz (*Champion*); NICARAGUA,

Chontales (*Belt*); COSTA RICA, Cache (*Rogers*); PANAMA, Chiriqui and Bugaba (*Arcé*, *Champion*), Calobre (*Arcé*).

This small form of *A. morvus* seems to be distinct, though we have some doubts on the subject. As regards the coloration of the female it agrees better with the South-American *A. morvus* than with *A. morta* of Central America; but the insect is much smaller, the anterior wings of the male more hooked at the apex, and the base of both wings have a greener tint.

In its range it occupies nearly the same area as *A. morta*, but we have not yet traced it beyond the district of Chiriqui in the State of Panama.

Mr. Druce in his monograph placed the name *Paphia ænomais*, Boisduval, as a synonym of *P. pithyusa*, Felder; but the types of the former submitted to us by M. C. Oberthür show that it was this species that Boisduval described.

Some of our specimens of this species seem to have been called *Paphia iphis* in Mr. Druce's monograph.

A. indigotica group.

10. **Anæa indigotica.** (Tab. XXXIII. figg. 1, 2 ♂; *A. zelica*, figg. 3, 4 ♀.)

Paphia indigotica, Salv. Ann. & Mag. N. H. ser. 4, iv. p. 180¹; Butl. & Druce, P. Z. S. 1874, p. 340²; Druce, P. Z. S. 1877, p. 645³.

Paphia zelica, Salv. Ann. & Mag. N. H. ser. 4, iv. p. 180⁴.

Paphia charonea, Godm. & Salv. Trans. Ent. Soc. 1880, p. 124⁵?

Alis cyaneo-nigris ad basin vix cyanescentibus, anticis fascia transversa arcuata apicem versus et margine posticarum externo schistaceo-cyaneis, posticis caudatis; subtus castaneis linea mediana communi et posticis lineis duabus margini externo subparallelis fuscis; costa auticarum et margine posticarum externo angulum analem versus albo irroratis, posticis ocello singulo ad medium marginis externi.

♀ alis brunneo-purpureo suffusis, anticis fascia lata fulva arcuata a costa fere ad angulum analem, posticarum apicē eadem colore; subtus alis fere ut in mare, sed pallidioribus et notatione omnino magis obvia.

Hab. COSTA RICA (*Van Patten*²), Irazu and Cache (*Rogers*); PANAMA, Volcan de Chiriqui (*Arcé*), Bugaba (*Champion*), Calobre (*Arcé*^{1 4}).—N. COLOMBIA ?⁵.

This species was first described from specimens sent us by Arcé from Calobre in the State of Panama^{1 4}. At the same time the great difference between the sexes of the species, without parallel in the genus, except in the case of the closely allied *A. xenica*, was not recognized, and the male and female were described as distinct species. Mr. Druce was the first to call attention to their real relationship³, and the receipt of more specimens fully confirms his view on this point.

The range of *A. indigotica* is restricted to Costa Rica, the State of Panama, and probably Northern Colombia. In Mexico and Guatemala the allied forms *A. promenax* and *A. xenica* take its place. In the interior of Colombia *A. charonea* is probably its representative, as the males agree in the general character of their markings. The female of *A. charonea*, however, is at present unknown to us.

Regarding Mr. Simons's specimens from the Sierra Nevada of Santa Marta, we are now of opinion that they probably belong to *A. indigotica* rather than to *A. charonea*, where we placed them⁵. Females are required to decide the point satisfactorily.

11. **Anæa xenica.** (Tab. XXXIII. figg. 5, 6.)

Paphia xenica, Bates, Ent. Monthl. Mag. i. p. 163¹; Druce, P. Z. S. 1877, p. 646².

A. indigotica affinis, sed alarum maris basi viridescenti fascia subapicali nulla et posticis margine externo haud limbato.

♀ quoque *A. indigotica* affinis, alarum basi viridescenti distinguenda.

Hab. GUATEMALA, Polochic valley (*F. D. G. & O. S.*¹), Purula (*Champion*).

A single female specimen of this remarkable species was for a long time the only one we possessed. This was obtained during our expedition to Guatemala in 1861-63, and formed the type of Mr. Bates's description¹. Since then we have received another female, and Mr. Champion was fortunate enough to secure a single male example at Purula during his recent visit to Guatemala. There is also a female, said to be from Guatemala, in the Hewitson collection in the British Museum.

12. **Anæa promenæa.** (Tab. XXXIV. figg. 1, 2.)

A. xenica valde affinis, sed alarum basi maris cyanescentiore feminae purpurascentiore differt.

Ab *A. indigotica* absentia fasciæ maris subapicalis et margine posticarum schistaceo-cyaneo differt.

Hab. MEXICO, Cordova (*Rümeli*).

This species seems to take the place of the Guatemalan *A. xenica* in Mexico, the male differing in having a bluer base to the wings, and the female being in the same part of a rich purple tint. The difference of both these species from *A. indigotica* is easily seen by comparing male examples.

The only specimens of *A. promenæa* that have reached us, a male and a female, were taken by the late Herr Rümeli near Cordova, and the male we now figure.

A. beatrix group.

13. **Anæa beatrix.** (Tab. XXXII. figg. 9, 10; Tab. XXXVI. figg. 9, 10 ♀.)

Paphia beatrix, Druce, Cist. Ent. i. p. 287¹; P. Z. S. 1877, p. 641².

Paphia charonea, Butl. & Druce, P. Z. S. 1874, p. 340³?

Alis cyaneo-nigris, anticarum basi et posticis fere omnino chalybeo-viridescentibus, anticis fascia (venis divisa) arcuata subapicali ad angulum analem producta alarum basi concolore, posticis caudatis; subtus læte sericeo-fuscis, rufescenti-fusco et albo undique irroratis, fasciis duabus valde indistinctis margini posticarum externe subparallelis alteraque alarum medium transeunte.

♀ alis fusco-nigris basi cærulescentibus, anticis macula ejusdem coloris ad apicem; subtus fuscis undique rufescenti-fusco irroratis, fasciis indistinctis ut in mare collocatis.

Hab. COSTA RICA (*Van Patten*³), Cache (*Rogers*); PANAMA, Volcan de Chiriqui (*Arceé, Champion*), Bugaba (*Champion*).

Mr. Druce's description of this beautiful species was based upon a single male specimen sent us by Arcé from the neighbourhood of the Volcano of Chiriqui ¹. Here and at Bugaba Mr. Champion obtained several specimens in good condition on the margin of forest, which show that the species is a more beautiful one than the type, which is rubbed, indicates. The female is very like that sex of *A. anassa* (= *A. cleomestra*, Hew.), but may be distinguished by the apical blue spot of the primaries being situated much nearer the apex of the wing instead of in a line with the blue band which is common to both wings.

A single female specimen was in Van Patten's collection, and appears to have been called *Paphia charonea* in Messrs. Butler and Druce's paper ³. We have another female from the same country, sent us by Mr. Rogers.

The alliances of *A. beatrix* are not very obvious, but we are inclined to associate it with the true *A. iphis* (Latr.) (= *A. maris*, Feld.) and with *A. lorna* (Druce).

U'''. Inner margin of primaries nearly straight.

A. perenna group.

14. **Anæa perenna.** (*A. amenophis*, Tab. XXXII. figg. 3, 4.)

Paphia amenophis, Druce, P. Z. S. 1877, p. 637 ¹ (nec Felder).

A. onophi similis, sed alis supra fere omnino cyaneo-nigris unicoloribus, maculis anticarum multo majoribus, posticarum margine externo ab apice ad caudæ finem cretaceo-cæruleo; subtus fere omnino ut in *A. onophi*.

♀ nobis ignota.

Hab. GUATEMALA, central valleys (*F. D. G. & O. S.*), San Gerónimo (*Hague, Champion*).
—COLOMBIA; PERU; LOWER AMAZONS.

Mr. Druce in his monograph considered this species to be Dr. Felder's *Nymphalis amenophis*, but on referring to the description of that species we are convinced that that name applies to an *Anæa* allied to *A. morvus*, and perhaps the same as *Paphia victoria*, Druce; but as the description of *A. amenophis* was based upon a female example, this point cannot be readily decided. Anyhow with the present species it has little in common, and we are obliged to give it a name.

In Guatemala *A. perenna* is not an uncommon insect, but we have not seen it from any other part of Central America. In Colombia it reappears, and thence spreads to Peru and even to the Lower Amazons, a specimen being in our collection which was sent us some years ago from Para by Mr. Henderson.

The specimen figured was taken at San Gerónimo, Guatemala.

15. **Anæa onophis.** (Tab. XXXII. figg. 1, 2; Tab. XXXIV. figg. 11, 12 ♀.)

Nymphalis onophis, Feld. Wien. ent. Monatschr. v. p. 110 ¹ (nec Boisduval).

Paphia onophis, Druce, P. Z. S. 1877, p. 637 ².

Paphia eubæna, Bdv. Lép. Guat. p. 50 ³.

Alis extus sinuatis cyaneo-nigris, basi cyanescentibus, anticis maculis quatuor aut quinque (interdum duabus) exterioribus pallide cyaneis, posticis punctis submarginalibus albidis; subtus omnino nitide cinereis fascia communi discali irregulari obscurioro, alteraque eodem colore submarginali in posticis extra eam punctis nigris notatis.

♀ alis extus valde sinuatis, colore alarum cæruleo pallidiorum quam in mare; subtus sordide pallide fuscis undique ferrugino-fusco irroratis.

Hab. MEXICO (?)³; GUATEMALA³, Polochic valley, Tablelands (*F. D. G. & O. S.*), Volcan de Atitlan, El Tumbador, Rio Naranjo, Panima (*Champion*); COSTA RICA (*Van Patten*); PANAMA, Chiriqui (*Arcé, Champion*), Bugaba (*Champion*), Calobre (*Arcé*).—COLOMBIA; ECUADOR¹; PERU.

This is not the *Paphia onophis* of Boisduval's published work; but nevertheless the species must pass under this name on Dr. Felder's authority, as he publicly used it several years before its inventor, though in a different sense.

The name actually given to it by Boisduval is *P. eubæna*, as reference to the type has shown us.

The original description by Dr. Felder was based upon a specimen from Ecuador, whence we also have examples. In these the submarginal spots of the primaries are five in number. At the other extreme of the range of the species a less number prevails, but there is no specific difference between individuals from these extremes.

A. onophis is closely allied to *A. pithyusa*, but the males may be distinguished by the base of the wings being bluer beneath; the discal dark band of the primaries has the outer edge much more irregular. If we are right in the determination of the female described above, it is a very different insect from that sex of the allied species. The base of the wings of the former is bright blue, in the latter they are hardly tinted, and the spots of primaries are very distinct in *A. pithyusa*, being five in number and nearly white; in *A. onophis* only two distinct spots are seen. The undersides present hardly any similarity.

Mr. Champion found this species on the banks of rivers in the forest during the dry season, and settled on dung in the pathways; on being disturbed they would fly to a tree-trunk.

16. *Anæa pithyusa*. (Tab. XXXII. figg. 7, 8.)

Nymphalis pithyusa, R. Feld. Verh. k. k. zool.-bot. Ges. Wien, 1869, p. 473¹.

Paphia pithyusa, Godm. & Salv. Trans. Ent. Soc. 1880, p. 124²; Druce, P. Z. S. 1877, p. 638³.

A. onophis similis, sed alarum basi viridescente, posticis paullo magis productis et subtus margine externo fasciæ communis in anticis haud sinuato, macula quoque fulva ad costæ posticarum medium distinguenda.

♀ a femina *A. onophis* omnino differt, maculis anticarum valde distinctis cæruleo-albidis, subtus omnino dilutioribus maculis sicut in mare.

Hab. MEXICO, Potrero (*Hedemann*¹), Cordova (*Rümeli*), Valladolid in Yucatan (*Gaumer*); GUATEMALA³, Central valleys and Pacific slope (*F. D. G. & O. S.*), Chisoy valley and Choctum (*Hague*), Rio Naranjo, Coatepeque, Cubilguitz (*Champion*);

BIOL. CENTR.-AMER., Rhopal., Vol. I., July 1884.

2 Y

NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*³); PANAMA, Bugaba (*Champion*), Veraguas (*Arcé*³).—COLOMBIA².

This is a common species throughout our region from Southern Mexico to Panama whence it passes into Northern Colombia, where Mr. Simons obtained it near Santa Marta. It was first described by Rudolph Felder from specimens, now in the Vienna Museum, obtained by Hedemann at Potrero, near Cordova, in Mexico. We have several examples from this locality, one of which we have compared with the type.

Though nearly allied to *A. onophis* and *A. arginussa* it is apparently quite distinct from both these butterflies as stated above. If we have described the right female of *A. onophis*, the differences in this sex are very much more apparent than in the males.

The fulvous spot on the costa of the secondaries and the simple curve of the outer edge of the transverse band of the primaries beneath connect this species with *A. herbacea*.

17. *Anæa artacæna*.

Paphia artacæna, Hew. Ex. Butt. *Paphia*, t. 2. ff. 6, 7¹; Druce, P. Z. S. 1877, p. 638².

Alis viridescenti-nigris basi viridescentiore, anticis fascia transversa bisecta a costæ medio ad angulum analem et puncto subapicali viridi-albidis; posticis spatulatis maculis submarginalibus ad apicem pallide viridescens et puncto nigro (intus albo) inter venam medianam et ramo suo secundo notatis; subtus cinerascens ferrugineo irroratis, fascia irregulari discali anticarum et plaga magna ad costam posticarum fere omnino ferrugineis.

♀ mari similis, sed alis subtus dilutionibus.

Hab. GUATEMALA, Choctum (*Hague*²); NICARAGUA, Chontales (*Belt*, *Janson*²); PANAMA, Bugaba (*Champion*), Veraguas (*Arcé*²).—COLOMBIA¹.

Hewitson described this species from a Colombian specimen in his collection, but we have not received any examples thence ourselves. It is, however, not a very uncommon species in Nicaragua, and we have traced it northwards as far as Vera Paz in Guatemala. Southwards it occurs sparingly in the State of Panama, but we have not yet seen any specimens from Costa Rica, where doubtless it is also found.

The alliances of *A. artacæna* are with *A. onophis* and *A. pithyusa*, but it is remarkably distinct, owing to the conspicuous greenish-white band on the primaries.

Mr. Champion's specimens were found on leaves in the dense forest.

A. xenocles group.

18. *Anæa xenocles*. (Tab. XXXII. figg. 5, 6.)

Paphia xenocles, Westw. Gen. Diurn. Lep. p. 319¹; Butl. & Druce, P. Z. S. 1874, p. 340²; Druce, P. Z. S. 1877, p. 639³.

Alis chalybeo-nigris, basi viridi-cærulescentibus, anticis apice subfalcatis margine interno integro, maculis quinque parvis viridi-cæruleis, prima pone medium versus costam posita et quatuor submarginalibus duabus

approximatis ; posticis breviter spatulatis serie submarginali macularum viridescentium ornatis ; subtus alis sericeo-fuscis griseo irroratis ; anticis ad marginem externum et posticis huc illuc nebulosis.

Hab. GUATEMALA, San Gerónimo (*Champion*); COSTA RICA (*Van Patten*²); PANAMA, Volcan de Chiriqui (*Ribbe*, *Arcé*³, *Champion*), Bugaba (*Champion*), Veraguas (*Arcé*³).—COLOMBIA³; VENEZUELA; BOLIVIA¹; S.E. BRAZIL³.

The type of this species was from Bolivia¹; our South-American specimens are from Colombia, Venezuela, and South-eastern Brazil. These and our many Central-American examples all agree fairly with one another. We notice, however, that they all have a submarginal row of greenish spots on the secondaries, not mentioned in Prof. Westwood's description.

Though present in Guatemala it is not common, and Mr. Champion appears to have met with it only at San Gerónimo. In the State of Panama it is one of the commonest species of *Anæa*. Here it abounds in the dry season and may be seen about the banks of streams.

19. *Anæa herbacea*.

Paphia herbacea, Butl. & Druce, Cist. Ent. i. p. 100¹; P. Z. S. 1874, p. 340²; Butl. Lep. Ex. t. 60. f. 3³; Druce, P. Z. S. 1877, p. 638⁴.

Alis supra cyanescenti-nigris, basi viridescentibus, anticis macula subapicali ejusdem coloris, posticis macula fulva ad costæ medium; subtus sericeo-griseo-ferrugineis, anticis fascia lata integra saturate castanea divis; posticis fascia angulata, et nebula ad marginem externum ejusdem coloris notatis, maculis duabus costalibus albidis; anticis acutis haud falcatis, posticis spatulatis.

Hab. COSTA RICA (*Van Patten*^{1 2 3 4}).

The only specimens we have of this species are those obtained by Van Patten, which served as Messrs. Butler and Druce's types; these came from Costa Rica, beyond which country we have not yet traced the species.

The fulvous spot near the middle of the costa of the secondaries is a curious character, shared alone, as far as we can see, by *A. pithyusa*, to which species *A. herbacea* has another slight character in common, in that the outer edge of the transverse band of the primaries beneath is simply curved and not abruptly broken. In other respects the two species are not very similar.

Of the female of *A. herbacea* we have as yet no tidings.

20. *Anæa glauce*.

Nymphalis glauce, Feld. Wien. ent. Monatschr. vi. p. 119¹.

Paphia glauce, Bates, Journ. Ent. ii. p. 342, t. 13*. f. 2²; Butl. & Druce, P. Z. S. 1874, p. 340³; Druce, P. Z. S. 1877, p. 640⁴.

Alis supra æneo-nigris, basi late plumbeo-cæruleis, anticis macula obliqua pone apicem, altera ad marginis externi medium ejusdem coloris; subtus sericeo-fuscescentibus griseo et fusco irroratis, anticis ad marginem externum et posticis lineis duabus margini externo subparallelibus nebulosis; anticis acutis vix falcatis; posticis leviter caudatis.

♀ mari valde similis, alis subtus ferrugineis, posticis fortiter caudatis.

Hab. COSTA RICA (*Van Patten*³); PANAMA, Bugaba (*Champion*), Veraguas (*Arcé*).—PERU; AMAZONS^{2 4}; RIO NEGRO¹.

This *Anæa* was discovered by Mr. Bates in the valley of the Upper Amazons during his celebrated expedition, but it was described by Dr. Felder under the name suggested for it by Mr. Bates¹.

It has now been traced to Costa Rica in the north and Peru in the south. Specimens from these various points, though varying to some extent, do not seem to be specifically separable. All have the peculiar brassy sheen which distinguished the species; but some specimens from Bugaba have rather less than usual, the blue of the base being more circumscribed. A Costa-Rica specimen, however, agrees accurately with typical examples from San Paulo, Amazons.

♂♂. Secondaries tailed in the female, but not in the male.

A. proserpina group.

21. *Anæa proserpina*.

Paphia proserpina, Salv. Ann. & Mag. N. H. ser. 4, iv. p. 181¹; Druce, P. Z. S. 1877, p. 645² (partim).

Paphia pedile, Druce, Cist. Ent. i. p. 287³.

Alis cyaneo-nigris, anticis ad basin et fascia arcuata subapicali ad angulum analem extendente cyaneis; posticis ecaudatis fere omnino cyaneis plaga magna ad angulum apicalem cyaneo-nigra, margine externo ad angulum analem lætore cyaneo; subtus læte castaneis albo sparsim irroratis, linea obsœleta communi mediana et posticis punctis albis submarginalibus notatis.

♀ major, alis nigris, basi læte cœruleis, anticis ad apicem macula elongata ejusdem coloris; subtus pallidioribus.

Hab. GUATEMALA, Polochic valley (*Hague*¹), Purula, Senahu, and Cubilguitz (*Champion*).

For this fine species we are indebted to Mr. Hague, who obtained our first specimens in the valley of the Polochic in Guatemala. Since then Mr. Champion has secured a good series, chiefly at Purula, at an elevation of about 4000 feet above the sea. Here they frequented the margins of the forest.

The only species we know of at all nearly allied to *A. proserpina* is *A. laura* of Costa Rica and Panama. This is easily distinguished by the coloration of the male, as pointed out below. The females of the two species seem to be quite alike.

22. *Anæa laura*. (Tab. XXXVI. figg. 4, 5.)

Paphia laura, Druce, P. Z. S. 1877, p. 647¹.

Paphia proserpina ♀?, Butl. & Druce, P. Z. S. 1874, p. 340²; Druce, P. Z. S. 1877, p. 645³ (partim).

A. proserpinæ proxima, sed alis multo obscurioribus anticarum apice vix fascia notato et posticarum margine cyaneo externo omnino absente, subtus quoque paullo saturatiore castaneis distinguenda.

♀ feminæ *A. proserpinæ* omnino similis.

Hab. COSTA RICA (*Van Patten*^{2 3}); PANAMA, Veraguas (*Arcé*¹).

A single male specimen from the province of Veraguas, sent us by Arcé, formed

the type of Mr. Druce's description of this species, which is a southern race of the Guatemalan *A. proserpina*. A female from Costa Rica attributed with doubt to *A. proserpina* by Messrs. Butler and Druce² we have little hesitation in placing here. In so doing we are influenced by the general similarity of the Costa Rica and Panama faunas, rendering it much more probable that this female belongs to the Panama than to the Guatemalan race.

23. **Anæa ambrosia.** (Tab. XXXVI. figg. 11, 12 ♀; Tab. XXXVII. figg. 6, 7.)

Paphia ambrosia, Druce, Cist. Ent. i. p. 288¹; P. Z. S. 1877, p. 648².

Alis cyanescenti-nigris, basi viridescentibus, anticis macula obliqua subquadrata conspicua pone apicem nitide viridis, margine externo eodem colore suffuso; posticis quoque maculis submarginalibus et margine externo ipso ejusdem coloris; subtus læte sericeo-castaneis, linea communi ab angulo anticarum apicali ad marginis interni posticarum medium, in posticis valde angulata fusco-ferruginea, anticis ad apicem et marginem externum albo marmoratis; anticis acutis haud hamatis; posticis oecandatis rotundatis.

♀ mari similis et macula anticarum apicali eodem modo collocata, subtus quoque castaneis sed pallidioribus; posticis cauda spatulata ornatis.

Hab. PANAMA, Volcan de Chiriqui (*Arcé*^{1,2}, *Zahn*, *Ribbe*, *Champion*), Bugaba (*Champion*).

This beautiful species was described by Mr. Druce from a specimen in our collection sent us by Arcé from the Volcano of Chiriqui¹, where other collectors have since found it, and where, and at Bugaba, Mr. Champion obtained us a good series of specimens, including the female.

As Mr. Druce remarks¹, *A. ambrosia* is a very distinct species, having no near allies that we know of. It seems to find its place in the genus next to *A. proserpina* and *A. laura*.

A. anassa group.

24. **Anæa anassa.** (Tab. XXXVI. figg. 1, 2 ♂, 3, 4 ♀.)

Nymphalis anassa, Feld. Wien. ent. Monatschr. vi. p. 120¹.

Paphia anassa, Druce, P. Z. S. 1877, p. 647².

Paphia cleomestra, Hew. Ex. Butt. *Paphia*, t. 2. figs. 8, 10³; Druce, P. Z. S. 1877, p. 641⁴.

Paphia ada, Butl. Ann. & Mag. N. H. ser. 4, xv. p. 222⁵.

Alis cyaneo-nigris, basi vix cyanescentiore, fascia arcuata transversa subapicali ad angulum analem producta cyanea; posticis margine lato externo ejusdem coloris; subtus saturate sericeo-brunneis albo irroratis fascia transversa indistincta communi ab anticarum apice ad medium marginis posticarum interni, fasciisque duabus aliis margini externo subparallelibus; anticis acutis, posticis ecaudatis.

♀ alis fusco-nigris, basi obscure cyanescente, fascia lata communi cyanea, supra eam costam anticarum propo macula duplici ejusdem coloris; subtus sordide ochraceis fusco sparsim irroratis; fasciis omnibus ut in mare.

Hab. NICARAGUA, Chontales (*Belt*⁴); PANAMA, Bugaba⁵ (*Arcé*, *Champion*), Veraguas⁵ (*Arcé*^{2,4}).—COLOMBIA^{2,3,5}; RIO NEGRO¹.

We have little doubt that the insects hitherto known as *A. anassa* and *A. cleomestra* are the males and females of one species; they have the same geographical range. Up to the present time *A. anassa* has only been known from male specimens, and on

the other hand females alone of *A. cleomestra* have reached us. It is true that considerable difference is observable in the markings of the upper surface of the wings, but we have parallel instances in such species as *A. proserpina*, *A. laura*, *A. ambrosia*, and others. On the under surface all the essential characters in the position of the transverse and submarginal lines correspond in both insects; in the female, however, they are much more clearly seen, the ground-colour of the wings being much paler. This, too, is a feature in many species of *Anæa*.

The range of *A. anassa*, as we now propose to call this species, extends from Colombia and the Rio Negro as far as Nicaragua, and, with the exception of the South-American localities, we have specimens of both sexes from all points of its range. The type of *A. cleomestra* came from Colombia³.

A. forreri group.

25. *Anæa forreri*, sp. n. (Tab. XXXIV. figg. 3, 4.)

Alis cyaneo-nigris, basi cyanescentibus, anticis fascia subapicali a costa fere ad marginem externum et maculis duabus confluentibus ad angulum analem cyaneis; anticis valde acutis; posticis ccaudatis; subtus pallide fuscis fusco irroratis et griseo præcipue ad angulum anticarum analem marmoratis, anticarum area discali ferrugineo suffusa.

Hab. MEXICO, Presidio near Mazatlan (*Forrer*).

Of this species we have a single male specimen captured by Mr. A. Forrer near Mazatlan. A second Mexican specimen in our collection, the source of which is unauthenticated, differs on the underside, which is much darker and more rufescent in tint, and the markings less distinct. This specimen may belong to another species, but our materials are insufficient to determine the point satisfactorily.

26. *Anæa hedemanni*.

Nymphalis hedemanni, R. Feld. Verh. k. k. zool.-bot. Ges. Wien, 1869, p. 473¹.

"Ad sectionem *N. Xenoclis*, Westw., et *Glauces*, Feld.; minor quam *Glauce*, alis anticis ad apicem fortiter productis, acute falcatis, in regione interna abbreviatis, posticis ccaudatis, sed apud ramum medianum tertium distincte angulatis, alis omnibus supra chalybæo-nigris, dimidio basali anticarumque maculis quinque subterminalibus chalybæis, subtus nitide cano-fuscis, albido strigillosis, fascia discali apud ramum medianum tertium angulata, introrsum effusa, striga limbali in anticis arcuata et zonam marginalem griseo-viridem amplexante anticarumque plaga anteo-subapicali diffusa fuscis, posticis punctis nonnullis posticis plus minus evanescentibus atris, intus glauco-cæruleo notatis."—*Felder, l. c.*

Hab. MEXICO, Potrero (*Hedemann*¹).

The only specimens of this species are the types in the Vienna Museum, a careful drawing of one of which has been recently sent us by Dr. Steindachner. From this we are of opinion that *A. hedemanni* belongs to a group in which the males have no appendage to the secondaries, and this brings it near the species next described as *Anæa orthesia*. The more falcate wings, together with blue spots across the apex of the primaries and parallel to the outer margin, show its distinctness from that insect.

27. *Anæa orthesia*, sp. n. (Tab. XXXIV. figg. 11, 12.)

Paphia mora, Druce, P. Z. S. 1877, p. 646¹ (partim).

Alis purpureo-nigris, basi cærulescente atomatis, anticis margine externo indistincte cæruleo; subtus læte sericeo-castaneo-fuscis undique saturate ferrugineo et albo irroratis, anticis valde acutis, posticis ecaudatis. ♀ alis fusco-nigris, basi cærulescentibus, anticis macula ad apicem cærulea, subtus fuscis rufescente suffusis et undique fusco et albo irroratis; posticis caudatis.

Hab. GUATEMALA¹, Polochic valley (*Hague*), Panima, Cubilguitz (*Champion*).

We have four specimens, three males and one female, of this species, which has no very near ally in Central America; but it is so closely related to a Colombian species, *A. mora*, that Mr. Druce hesitated to separate it in his monograph¹.

From *A. mora*, however, it may be recognized by the more purple shade of the wings, the blue at the base being more restricted and less of a greenish shade.

The female is like that sex of *A. ænomais*, but the wings are more acute and the base of a bluer shade. Our single female was taken by Mr. Champion at Cubilguitz in Northern Vera Paz. He also captured a male at Panima in the Sinanja valley. Our other specimens are from the valley of the Polochic, into which the Sinanja flows.

A. orthesia is also allied to *A. odilia* (Cr.), and more remotely to *A. basilis* (Cr.).

A. dia group.

28. *Anæa dia*, sp. n. (Tab. XXXIV. figg. 7, 8.)

Alis viridescenti-nigris, anticearum basi vix viridescentiore; fascia arcuata, venis divisa, subapicali ad angulum analem producta nitide viridescente, posticis eodem colore late marginatis, ciliis albis, ecaudatis; subtus saturate sericeo-brunneis, anticearum apice et posticearum margine externo canescentibus; posticis plaga magna discali saturate rufo-brunnea, margine interno dilutiore.

Hab. PANAMA, David (*Champion*).

Mr. Champion captured several male specimens of this beautiful species near the town of David. They were caught on bushes on the top of the hill of San Cristobal in the hottest sun.

The nearest ally to *A. dia* is *A. polyxo* from Brazil, the type of which, obtained by Beske, is now in our collection. Another example from the Ucayali differs slightly from the type, the markings of the wings above being of a much bluer tint. When more specimens of these rare insects come to hand it may be necessary to separate these two races. From both, however, *A. dia* differs in the coloration of the markings of the upper surface of the wings, the general tint of which is of a green rather than a blue cast.

29. *Anæa aureola*. (Tab. XXXVII. figg. 1, 2 ♂, 3 ♀.)

Paphia aureola, Bates, Ent. Monthl. Mag. iii. p. 152¹; Druce, P. Z. S. 1877, p. 648².

Alis supra olivaceo-nigris; fascia lata communi in anticis subapicali arcuata a costa ad angulum analem deinde posticearum marginem externum occupante usque ad angulum analem nitide æneo-viridi; subtus saturate sericeo-fuscis, anticis linea ab angulo apicali sordide albida, macula magna marmorata ad angulum analem

posticis fascia valde irregulari transnebulatis, linea obsoleta margini externo subparallela, marginibus interno et externo albido irroratis; anticis haud falcatis; posticis rotundatis ecaudatis.
 ♀ alis quoad colorem mari similibus, sed fascia æneo-viridi nulla, anticis autem fascia transversa albida ultra cellulam; subtus anticearum dimidio distali latissime albido marmorato; posticis caudatis.

Hab. GUATEMALA, Polochic valley, San Gerónimo (*Hague*).—COLOMBIA².

For this species we are indebted to Mr. Hague, whose collectors, employed in our behalf, secured three male specimens and one female in the valley of the Polochic and at San Gerónimo. The fact that Mr. Champion, working over the same ground, did not meet with it, is sufficient testimony to its rarity. The statement of its occurrence in Colombia rests on the authority of a specimen in Mr. H. G. Smith's collection, said to have been obtained in that country by Mr. Birchall². This specimen was examined by Mr. Druce, but we have not seen it ourselves.

A. aureola was compared by Mr. Bates with *A. anassa*¹, but its distinctness from that species is very obvious. Unless it be *A. dia*, now described, and *A. polyxo* of South America, *A. aureola* has no near affines.

b. Body slender, anal angle of secondaries produced as a lobe.

c'. Secondaries of both sexes bearing a spatule.

30. *Anæa electra*.

Paphia electra, Westw. Gen. Diurn. Lep. p. 319¹; Hew. Ex. Butt. *Siderone* and *Paphia*, ff. 1, 2²; Butl. & Druce, P. Z. S. 1874, p. 340³; Druce, P. Z. S. 1877, p. 649⁴.

Alis sordide fulvis, anticearum apice et margine externo fuscis limbo interno valde sinuoso; posticis rufescenti-fulvis extus fusco limbatis; subtus pallide sericeo-fuscis, fusco irroratis, posticis linea bifida fusca transfasciatis, lineisque duabus margini externo subparallelis; anticis valde hamatis, posticis caudatis angulo anali producto.

♀ mari similis, sed major.

Hab. MEXICO², Vera Cruz¹; BRITISH HONDURAS, Corosal (*Roe*⁴); GUATEMALA, Polochic valley (*Hague*⁴), San Gerónimo (*Hague*, *Champion*), Panima (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*³); PANAMA, Volcan de Chiriqui (*Arcé*, *Champion*).

The type of this species is said to have come from Vera Cruz¹, but we have no Mexican examples. In Guatemala, however, the species is by no means uncommon, and is found throughout the lowlands of the eastern districts and as far north as the vicinity of Corosal in British Honduras. Southwards it occurs everywhere, as far as the neighbourhood of Chiriqui, beyond which point it has not been traced.

A. electra has no near ally in the genus, but belongs to the same section as *A. jansoni* and others, the common characters of which are indicated above.

Mr. Champion found this species in dense forest, where it was seen flying round the tops of the highest trees, but occasionally descending to the streams, and settling on the overhanging boughs.

31. *Anæa jansoni*. (Tab. XXXV. figg. 4, 5.)

Paphia jansoni, Salv. Ann. & Mag. N. H. ser. 4, vii. p. 165¹; Druce, P. Z. S. 1877, p. 649².

Alis anticis fusco-nigris maculis tribus aut quatuor fulvis notatis, una inter ramos radiales, altera inter venam medianam et ramum suum secundum, tertia subapicali; posticis læto testaceis, regione costali late flavida; subtus pallide fulvis undique irroratis sicut in *A. electra*; posticis fascia transversa nigra bisectis; anticis valde hamatis, posticis spatulatis et angulo anali valde producto.

♀ alis anticis fusco-nigris ad marginem internum rufo-fulvis, maculis quatuor, linea arcuata collocatis, a costæ medio ad angulum analem transeuntibus, altera ad apicem, flavis; posticis rufo-fulvis fusco limbatis; subtus fere ut in *A. electra*, sed alis minus sericeis, paullo obscurioribus et magis distincte irroratis.

Hab. NICARAGUA, Chontales (*Janson*¹); PANAMA, Volcan de Chiriqui (*Champion, Trotsch*).

Until quite recently we had only seen female specimens of this fine species, and these had reached us both from Nicaragua and the State of Panama. A short time ago Dr. Staudinger, with his usual kindness, submitted to us a male from Chiriqui, which, though differing considerably from the female, we have no doubt is the male of *A. jansoni*. The most obvious point of distinction is in the secondaries, which have the whole of the costal region yellow as in *A. panariste*. With this clue we are enabled to state that the beautiful insect described by Mr. Druce as *A. berthæ* is in all probability the female of *A. panariste*, though the contrast between the sexes is much greater than in *A. jansoni*.

A. jansoni was discovered by the late E. M. Janson at Chontales in Nicaragua; but the further extension of its range into the State of Panama has been proved by Mr. Champion, who took several specimens on the Volcano of Chiriqui, at an elevation of about 3000 feet.

32. *Anæa excellens*. (Tab. XXXV. figg. 6, 7.)

Paphia excellens, Bates, Ent. Monthl. Mag. i. p. 162¹; Druce, P. Z. S. 1877, p. 649².

Alis supra fuscis, basi (præter costam et venas) fulvis, anticis serie duplici punctorum ochraceorum margini externo subparallelis, aliisque clongatis inter eos et cellulam ejusdem coloris; posticis quoque serie duplici punctorum similiter ornatis, margine externo et cauda clongata ochraceo variegatis; subtus notationibus omnibus fere ut in *A. electra*, sed multo magis distinctis, posticis macula reniformi prope costæ medium argentea ornatis; anticarum costa valde arcuata, falcata; posticis bene spatulatis et angulo anali producto.

♀ mari similis, sed plerumque major et alis supra pallidioribus forsân distinguenda.

Hab. GUATEMALA, Central valleys (*F. D. G. & O. S.*¹), San Gerónimo (*Champion, Hague*).

This wonderful species is extremely local in Guatemala; we obtained it in the hills skirting the east side of the plain of Salama, near the village of San Gerónimo, and here, too, Mr. Champion found it, but in no other locality has it yet occurred, so far as we know. Here it associates with *A. electra* and has similar habits. In its markings and the general shape of the wings *A. excellens* has no near allies in the genus, but it evidently belongs to the section containing *A. electra*, *A. jansoni*, and others.

d'. Sexes coloured nearly alike; secondaries of female alone tailed.

33. **Anæa callidryas.** (Tab. XXXV. figg. 8, 9 ♀.)

Nymphalis callidryas, R. Feld. Verh. k. k. zool.-bot. Ges. Wien, 1869, p. 474¹.

Paphia callidryas, Druce, P. Z. S. 1877, p. 649².

Alis pallidissimo fulvis ad basin opalescentibus, anticarum apice fusco, posticis linea submarginali lunulata notatis; subtus ochraceo-fulvis rufescente marmoratis, anticis ad basin, angulis apicali et anali rufescentibus albido marmoratis; linea communi eodem colore ab angulo anticarum apicali ad angulum posticarum analem producta; posticis albido irroratis linea submarginali rufescente et extra eam omnino rufescentioribus; anticis leviter falcatis, angulo anali quoquo hamatis, posticis margine externo leviter undulato et ad venæ medianæ finem vix producto.

♀ mari similis, sed posticis spatulatis.

Hab. MEXICO, Cordova (*Nieto*¹); GUATEMALA, Polochic valley (*Hague*), Panima (*Champion*).

Of this singular species we have two female specimens from Guatemala. Some time ago we examined the type in the Vienna Museum, and convinced ourselves that it was a male of our Guatemalan female; and this view is confirmed by a careful drawing sent us by Dr. Steindachner of the Vienna type, which has enabled us satisfactorily to come to the conclusion that the Chiriqui specimen described below is a distinct though allied species.

Mr. Champion caught his specimen on the banks of the Rio Sinanja near open forest.

There can be no doubt that this singular species is rightly placed in *Anæa* and not in *Siderone*. We cannot see how many slips pass between the costal nervure and the costa, but the first, second, and third subcostal branches all coalesce with the costal. In *Siderone* all these nervules run independently to the margin.

34. **Anæa opalina.** (*A. callidryas* ♂, Tab. XXXIV. figg. 9, 10.)

A. callidryadi certe affinis, sed anticarum maris apicibus et margine externo saturatius fulvis, maculis duabus rotundis diaphanis inter ramos medianos; posticis ad marginem externum multo magis fulvo tinctis et margine ipso magis sinuato et angulo anali producto; subtus omnino saturationibus et marginibus alarum ambarum ferrugineis.

Hab. Volcan de Chiriqui (*Champion*).

We have a single male specimen of this fine species, which we at one time considered to be the male of *A. callidryas* and so named it on our plate. A drawing of the type of that species showed us our error, and we now describe the present species under a different name.

Mr. Champion captured this specimen on dung near the margin of the forest, at an elevation of 4000 feet, on the Volcano of Chiriqui.

c. Body slender, anal angle of secondaries not produced as a lobe.

35. *Anæa echemus*.

Cymatogramma echemus, Doubl. & Hew. Gen. Diurn. Lep. p. 316, t. 49. f. 4¹; Herr.-Sch. Schm. Ins. Cuba, p. 4².

Paphia echemus, Druce, P. Z. S. 1877, p. 636³.

Megalura poeyi, Lefebvre in R. de la Sagra's Hist. de Cuba, vii. p. 241⁴.

Alis supra brunneis ad basin ferrugineis, anticarum apicibus pallidioribus, posticis caudatis ocellis duobus aut tribus ad medium marginis externi; subtus sordide griseo-fuscis undique irroratis, anticis ad basin et ad marginem externum obscurioribus, posticis linea valde irregulari transversa ad costam albo atomata.

Hab. HONDURAS¹.—CUBA^{2 4}.

We have some doubts whether this species ought to be included in our fauna, but it was originally described as coming from Honduras, and we have in our collection a specimen, formerly in that of Dr. Kaden, stated to be from that country. For this reason we admit it here.

Its true home is undoubtedly the island of Cuba, where, according to Dr. Gundlach, it is common on the sea coast². It is included in La Sagra's work under the name of *Megalura poeyi*, and is said to be found near Havana and also in the island of Jamaica; but this latter statement requires confirmation.

A. echemus is obviously allied to *A. verticordia* of the island of Haiti, and these, with another species recently brought by Mr. Angas from Dominica, which we have called *A. dominicana*, form a separate group of the genus probably confined to the West-Indian islands. For this section Westwood proposed the name *Cymatogramma*; but in view of the great diversity of the arrangement of the costal nervures in *Anæa* generally, we think it perhaps best to keep this species and its allies in that genus.

HYPNA.

Hypna, Hübner, Verz. bek. Schm. p. 56 (1816); Westw. Gen. Diurn. Lep. p. 314.

The chief distinction of this genus, if such it be, lies in the peculiarity of its markings as compared with some species of *Anæa*. We can find no very tangible difference in structure from such species as *A. electra*, and we should not be surprised if at some future time the small-bodied large-winged species of *Anæa*, such as *A. electra*, should be separated from *Anæa* and placed in closer connection with *Hypna* and *Protogonius*, or that both these genera should be merged in *Anæa*.

Of *Hypna* we can only recognize three species, though several more have been suggested. These all belong to tropical America, *H. clytemnestra*, the only one occurring within our limits, having a very wide range.

Two subcostal branches of the primaries are emitted before the end of the cell, both

of which, and also the third branch, unite with the costal, and there are two slips beyond the costal to the costa itself. There is practically no middle discocellular, as the radials start from the same point; the upper discocellular is very short, and the lower crosses the end of the cell in a curve to the median, some way beyond the origin of the second branch. The front legs of the male, the palpi, and the secondary male sexual organs are quite similar to those of *Anæa electra*.

1. *Hypna clytemnestra*.

Papilio clytemnestra, Cr. Pap. Ex. t. 137. f. A, B, & t. 364. A, B¹.

Hypna clytemnestra, Doubl. & Hew. Gen. Diurn. Lep. t. 49. f. 1²; Bates, Journ. Ent. ii. p. 339³.

Hypna clytemnestra, *globosa*, *hubneri*, *hubneri* var. et *velox*, Butl. P. Z. S. 1866, pp. 208, 209⁴.

Anticis plus minusve hamatis, costa arcuata, posticis margine externo dentatis, vena mediana spatulata vena submediana producta, nigricanti-fuscis; anticis ad apicem nigricantioribus fascia lata transversa a costa fere ad angulum analem extensa flavido-alba, punctis duobus subapicalibus albis; posticarum costa flavida maculis duabus coloris ejusdem ad angulum apicalem; subtus late brunneis undique marmoratis, maculis variis ad basin argenteis, fascia anticarum sicut supra ad costam argentea et fusco lentiginosa, macula subapicali argentea.

♀ mari similis, sed major et alis paullo dilutioribus.

Hab. NICARAGUA, Chontales (*Belt, Janson*); PANAMA, Calobre (*Arcé*), Lion Hill (*M^cLeannan*).—SOUTH AMERICA, Colombia to South Brazil.

In the P. Z. S. of 1866 Mr. Butler reviewed the genus *Hypna*, which up till that time contained but one species. He there broke it up into what he considered six distinct species, which he described under various names. He remarks that the acuteness or non-acuteness of the fore wings is no proof of the identity of the species, and also that pattern and coloration can only be used as general characters, as they vary considerably; but he then proceeds to describe the new species, making use of these characters, which he says are valueless. Our large series, of thirty-four specimens, of what we take to be *H. clytemnestra*, comes from countries ranging from Panama to South Brazil, in which, it is true, individuals show considerable variation in form, in the convexity of the costa, the apex of primaries being either acute or hooked, in the extent to which the outer margins are excavated, in the prolongation of the secondaries, and also in the size of the spatulate tail. On a careful examination of our series, including several of Mr. Butler's types, we find every gradation in form between the extremes; and this apparently occurs without any relation to the locality in which the insect exists, hence we are compelled to reunite them under one name.

In Colombia and Venezuela there is a race, of which we have several specimens, showing a considerable amount of rufous colouring on the secondaries; this has been described by Mr. Butler as *H. rufescens*. We likewise have a third from Pernambuco, which appears to us to be distinct from *H. clytemnestra*, in which the

band in the primaries and also the other spots are of a pure white instead of cream colour*.

Mr. Belt met with *H. clytemnestra* in Nicaragua, and this appears to be its extreme northern range, whence to Brazil it is not uncommon. Mr. Bates found it generally distributed throughout the Amazons valley, flying near the borders of the forest and settling on projecting branches of trees.

PROTOGONIUS.

Protoponius, Hübner, Verz. bek. Schm. p. 100 (1816); Westw. Gen. Diurn. Lep. p. 313.

This is another genus closely allied to *Anæa*, and, considering the variation in structure found within it, *Protoponius* as well as *Hypna* might be also included. There are, however, characters in the coloration, as well as in the shape of the primaries, which seem to justify its retention as a separate group.

The median nervure of the primaries is prolonged, and carries a long projection on the outer margin. Two subcostal branches are emitted before the end of the cell, and both join the costal. The third branch splits, and one branch joins the costal and the other proceeds to the margin. There are three slips between the costal and the costa. The upper and middle discocellulars are both moderately long, and in this respect *Protoponius* differs from *Hypna*. There are no special characters in the front legs of the male, the palpi, or the male sexual organs to distinguish this genus from *Hypna* or, indeed, from *Anæa electra*.

As in *Hypna* Mr. Butler has separated a number of species of *Protoponius*, including no less than fifteen in his two papers on the subject. The value of several of these is open to question, especially those which occur in the Amazons valley, where specific limits often cannot be traced with precision. Within our limits two closely allied species occur, one of which ranges from Mexico to Costa Rica; the other takes its place in the State of Panama and passes into the southern continent.

1. *Protoponius cecrops*.

Protoponius cecrops, Doubl. & Hew. Gen. Diurn. Lep. p. 314, t. 49. f. 2¹; Butl. P. Z. S. 1873, p. 773²; Butl. & Druce, P. Z. S. 1874, p. 341³.

Alis anticis hamatis margine externo medialiter multo producto, fusco-nigris; costæ dimidio proximo et fascia arcuata a basi ad angulum analem fulvis; fascia altera obliqua, ultra cellulam valde irregulari, macula submarginali inter venam medianam et ramum suum secundum et altera apicali flavis; posticis spatulatis et

* *Hypna forbesi*, sp. n.

H. clytemnestræ affinis, sed multo minor, alis ad basin grisescentioribus, fascia anticarum angustiore ad angulum analem minus extensa et pure alba nec flava, differt; anticis paullo hamatis.

Hab. BRAZIL, Quipapa, in the Province of Pernambuco (*W. A. Forbes*).

Mus. nostr.

angulo anali producto fulvis, margine externo fusco-nigro lunulas quatuor flavas continente; subtus alis ochraceo-fulvis, undique marmoratis.

♀ mari similis, sed major.

Hab. MEXICO, Cordova (*Rümeli*); GUATEMALA, San Gerónimo, Polochic valley (*F. D. G. & O. S.*); Senahu, Cahabon, Cubilguitz, Panima, Las Mercedes, and San Isidro (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*).—ECUADOR¹.

The type of *P. cecrops* is said to have come from Guayaquil in Western Ecuador, but we have never seen an authentic specimen from further south than Costa Rica. The figure given in the 'Genera of Diurnal Lepidoptera' fairly represents the Central-American insect, except that the latter has the marks in the apical part of the primaries of a purer yellow. The characteristic yellow apex is, however, shown, though rather more tawny in tint.

P. cecrops is very closely allied to the next species, and the only tangible difference is in the apex of the primaries being yellow, instead of a band of yellow spots running more or less parallel to the outer margin.

2. *Protogonius tithoreides*.

Protogonius tithoreides, Butl. P. Z. S. 1873, p. 774¹.

P. cecropi persimilis, sed anticarum apice haud flavo et maculis sex submarginalibus flavis notatis, prima, quinta et sexta maximis; fascia quoque fulva extus flavo limbata, distinguenda.

Hab. PANAMA, Volcan de Chiriqui, Bugaba and David (*Champion*), Calobre (*Arcé*), Lion Hill Station (*M. Leannan*).—COLOMBIA¹; VENEZUELA.

This species can be distinguished from *P. cecrops* by a slight character which seems constant. The primaries have a band of yellow spots more or less parallel to the outer margin instead of the apex alone being yellow. That it should bear this name bestowed upon it by Mr. Butler seems certain, but whether it can be always distinguished from other forms of *P. hippona* is perhaps doubtful. We have a large series of *Protogonius*, and we feel convinced that this is one of those cases where the larger the series examined the greater will be the difficulty in defining the races into which a smaller series seems divisible.

Protogonius tithoreides is abundant in the State of Panama, from the district of Chiriqui to the line of railway. In Costa Rica it is replaced by *P. cecrops*.

Fam. LIBYTHEIDÆ*.

LIBYTHEA.

Libythea, Fabricius, Mag. f. Insekt. vi. p. 284 (1807); Westw. Gen. Diurn. Lep. p. 412.

This is a very widely distributed genus, occurring in temperate and tropical countries nearly all over the world, except Australia and the islands of the Pacific. In continental America we have one wide-ranging species in *L. carinenta*, which extends from the southern frontier of the United States to the Argentine Republic. North-east of this a closely-allied form exists in *L. bachmani*, which is, perhaps, hardly separable from *L. carinenta*. The islands of Cuba and Haiti have each a distinct species, raising the total of the American species to three or four. In Europe and North Asia with Japan we find one species; in India and the islands of Java, Borneo, &c. two or three closely allied forms; in New Guinea, the adjoining islands, the Philippines, &c. other species occur; and in West Africa we also find one allied to the European form.

The early stages of *Libythea bachmani* of North America have been carefully described and drawn by Mr. W. H. Edwards, and the transformations were long given by Boisduval and Leconte.

The subcostal nervure of the primaries emits two branches before the end of the cell, the upper radial and the middle discocellular start from the same point of the subcostal, there being no upper discocellular (or if present it is extremely short), the middle and lower discocellulars form one curve, the lower being slightly the longer, and both being atrophied towards the middle, where the lower radial joins them. The lower discocellular meets the median some way beyond the origin of the second branch. There is a slender internal nervure proceeding from the submedian to the base of the wing. The secondaries have atrophied discocellulars, the lower one of which meets the median close to the origin of the second branch. The front legs of the male have a rather

* The systematic position of the genus *Libythea* has long been a matter of discussion. Prof. Westwood (Gen. Diurn. Lep. p. 412) places it in a distinct Family, and we here follow him. Mr. Bates, on the other hand, includes the genus as a separate subfamily of Erycinidæ (Journ. Ent. ii. p. 176). There can be little doubt that *Libythea* occupies a somewhat intermediate position between the great families of the Nymphalidæ and Erycinidæ. As in the former the pupa is suspended freely by the tail, whilst that of the Erycinidæ is either rigidly attached by the extremity or secured with a girdle across the middle. The structure of the fore legs of the female is as in the Erycinidæ, these legs being perfect and not more or less atrophied as in the Nymphalidæ. In the extraordinary development of the palpi *Libythea* stands alone, and its general appearance and extensive distribution also indicate an isolated position. The construction of the male secondary organs follows in main the same general plan as in the genera of the Nymphalidæ, whereas, so far as we can see at present, the Erycinidæ diverge widely. Another point remains to be noticed, and that is the presence in the primaries of *Libythea* of an internal nervure. This nervure is always found in the Danainæ, in *Hetera* and its allies of the Satyrinæ, and, so far as we have seen at present, in the Erycinidæ. In the Nymphalinæ it is absent altogether.

long slender coxa, which is slightly produced beyond the trochanter-coxal joint; femur swollen= $\frac{2}{3}$ coxa; tibia and tarsus about=femur, and both of them cylindrical. Front legs of the female slender but perfect, with five tarsal joints, claws, &c.

Palpi exceedingly long, the terminal joint longest and gradually tapering to the end. The antennæ have about thirty-eight joints, and terminate in a well-defined club. The secondary male organs have a tegumen with a central spine which terminates in a short depressed hook; the harpagones are simple lobes, with rounded extremities projecting beyond the hook of the tegumen, and with slightly hairy lateral surfaces but no spines. Above the tegumen, and apparently formed by an independent prolongation of the penultimate segment, is a blunt projection, and on either side of it a long recurved hook: the shape of this piece is very similar to that of the tegumen itself in many Erycinidæ.

1. *Libythea carinenta*.

Papilio carinenta, Cram. Pap. Ex. t. 108. f. E, F¹.

Libythea carinenta, Butl. & Druce, P. Z. S. 1874, p. 352²; Streckert, Cat. N. Am. Macrol. p. 105³.

Libythea carinata, Burm. Descr. Phys. Rep. Arg. v. p. 196⁴.

Alis fusco-nigris, anticis maculis quatuor ultra cellulam, tribus in linea obliqua, albis, striga cellulari et plagis duabus ad angulum analem fulvis; posticis dilutioribus plaga valde irregulari discali fulva; subtus anticis fere ut supra, apice et posticis omnino griseis fusco irroratis, his interdum fasciis duabus transversis nebulosis; anticis apice valde obtuso margine externe valde sinuato, posticis rotundatis leviter dentatis.

Hab. NORTH AMERICA, Arizona³.—MEXICO, Acapulco (*J. J. Walker*), Cordova (*Rümeli, Höge*), Oaxaca (*Fenochio*), Valladolid in Yucatan (*Gaumer*); GUATEMALA, Polochic valley, Pacific coast (*F. D. G. & O. S.*), Paraiso (*Champion*); HONDURAS, San Pedro (*G. M. Whitely*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²), Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Champion*), at sea near Punta Mala (*O. S.*), Empire Station (*J. J. Walker*).—SOUTH AMERICA to Guiana¹ and Argentine Republic⁴.

This species has a very wide range over South America from the Argentine Republic northwards, and it is also found throughout our region. On the upperside the coloration of the wings is fairly constant, but we notice in some specimens that the white spots of the primaries are of a russet colour, though this peculiarity is not confined to any special locality. On the under surface, especially of the secondaries, the variation is considerable, some specimens having these wings mottled grey with clouded patches of brown, in others the surface is of nearly uniform tint.

Though found throughout our region, *L. carinenta* exclusively frequents the hotter portions of the country. Mr. Champion met with it on river-banks, alighting on stones or on small twigs, and when at rest the wings are closely shut and the primaries are placed very far back, giving the insect in this position a very peculiar appearance. Mr. Champion considers that in its habits the resemblance of *L. carinenta* is much more with the Nymphalidæ than with the Erycinidæ.

Fam. ERYCINIDÆ.

In studying the members of this family we have had occasion to make a large number of dissections, prepared from representatives of by far the greater part of the recognized genera; these preparations have all necessarily been made from dry specimens, and the process we have adopted has only enabled us to reserve the chitinous structures such as are not soluble in caustic potash. The parts we have been able to prepare satisfactorily are the wings, the antennæ, the palpi, and the legs, as well as the secondary sexual organs of the male; those of the female, except as regards a very few points, have not given us any tangible materials for generalization. By a process, for the knowledge of which we are indebted to Mr. Wood-Mason, by which the colour of the scales of the wings and the hairs of the legs and body have been destroyed, we have been enabled to see the extent to which the discocellular nervules of the wings have become atrophied and the exact relative position of each nervule and branch, whilst the different parts of the legs and the number of the tarsal joints have been traced with a certainty not otherwise attainable. Our observations have led to the discovery of some characters not noted by previous writers. One of the most noteworthy is a peculiarity in the front legs of the males, where the trochanter is inserted at various distances from the end of the coxa, leaving a long projecting portion of the coxa beyond the trochanter joint. In the front leg of the female the relative position of the coxa and trochanter is normal. The tarsus of the front legs of the male in the family Erycinidæ is more or less atrophied as regards its joints, both as to their number and development, while those of the female are perfect, of the normal number of joints, the terminal joint bearing claws and the usual appendages.

The next point of importance is the presence or absence in the secondaries of both sexes of what we have termed a basal nervure; this nervure originates at the joint of the wing, and proceeds upwards outside the precostal lobe. It is fully developed, and very evident in by far the majority of American Erycinidæ; it is either wholly absent or quite rudimentary in all the Old-World genera, and it is absent also in the New-World genera *Eurygona*, *Methonella*, *Hades*, and *Helicopis*. These four genera, with those of the Old World, form our first subfamily, characterized by the secondaries not having a basal nervure or only a rudimentary one. The remaining genera form our second subfamily, characterized by the presence of a well-developed basal nervure. The removal of the first four American genera named above enables us to divide the remaining genera into three sections, according as the subcostal nervure of the primaries has four, three, or two subcostal branches. The position of these branches with reference to the end of the cell enables us to subdivide the second section into three groups, in the first of which all the branches are emitted beyond the cell, in the second one is emitted before and two beyond the end of the cell, in the third two are emitted before the end of

the cell and one after it. These form the main divisions of the scheme submitted below.

Regarding the secondary sexual organs of the male much diversity prevails, as might be supposed, but one common character pervades the whole, the tegumen being a hood-like structure with a setose lateral lobe on either side, below which proceed two strong hooks curved at first inwards and then outwards, sometimes overlapping one another. The harpagones are very varied in form, as is also the penis; this will be seen from our descriptions which follow. We have not ventured to make much use of these characters in our scheme of classification; we have, nevertheless, availed ourselves of them in grouping some of the genera in their order of sequence.

Regarding the females, all we have done is to notice certain very definite structures in the bursa copulatrix; these being of a hard chitinous nature have survived the process of preparing the specimens; their shape is various, but they are by no means universally present; their further investigation, as well as the organs to which they are attached, must be undertaken from fresh specimens properly prepared for that purpose.

To return to the question of classification, we should have preferred to have adhered the very useful scheme published by Mr. Bates in 1867, now eighteen years ago, but the discovery of fresh characters seems to justify our recasting the classification of the family. We have, we believe, introduced greater precision in our definitions, and this, we hope, we have done without overstraining natural ties.

It must not be supposed that the characters we have given for the genera below are by any means exhaustive; they are rather intended to supplement those given in the 'Genera of Diurnal Lepidoptera'; thus we seldom allude to the shape of the wings or the clothing of the palpi or front legs.

Subfam. *NEBEOBIINÆ* *.

Secondaries without or with a rudimentary basal nervure.

EURYGONA.

Eurygona, Boisduval, Sp. Gén. i. t. 21. f. 3; Westwood, Gen. Diurn. Lep. p. 437.

The genus *Eurygona* is characteristic of Tropical America. It contains about ninety species, which are spread from Arizona and Southern Mexico to South Brazil, the

* In this subfamily we include all the Old-World genera of Erycinidae, viz.:—*Nemeobius*, *Dodona*, *Zemeros*, *Abisara*, *Stiboges*, and *Tacila*. Also of the New-World genera *Helicopis*, as well as those mentioned in the following text. This subfamily therefore differs from that of Mr. Bates by the addition of *Eurygona*, *Methonella*, *Hades*, and *Helicopis*, and by the subtraction of *Alesa*, *Eurybia*, *Eunogyra*, *Mcosemia*, *Cremna*, and *Hyphilaria*. We have not yet discovered satisfactory characters whereby to separate the Old from the New-World genera of this subfamily.

metropolis of the genus being probably the valley of the Upper Amazons to the base of the Andes. Within our limits we now know of twenty species; three of these are found in Southern Mexico. Their numbers gradually increase as we approach Panama, where twelve species occur. No less than seventeen species are found between Nicaragua and Panama, and of these six pass southwards into Colombia and Ecuador, and one of them (*E. crotopus*) to the Amazons and Guiana. One species (*E. abreas*) has been recorded from Arizona*. This is evidently allied to *E. mys*, of which *E. sergia* is the Central-American representative, but apparently distinct.

As is well known, the number of subcostal branches in the primaries in this genus is variable, and we have used this character to subdivide it into three sections according as the species have four, three, or two of these branches, those with three being much the most numerous.

E. aurantiaca has four branches to the subcostal of the primaries, two before the cell and two after it. The upper radial meets the subcostal some way beyond the end of the cell; the middle discocellular is perfect and meets the subcostal a little beyond the second branch; it runs almost in a line with the lower radial, making a slight angle where the atrophied lower discocellular meets it; this latter joins the median some way beyond the second branch; the costal side of the cell is shorter than the median side. The secondaries appear to be without a basal nervure; the upper discocellular runs in a line with the radial and meets the subcostal beyond the first branch; the lower discocellular is atrophied for its upper half, it makes a large obtuse angle with the upper discocellular and meets the median some way beyond the second branch; the costal side of the cell is much shorter than the median side. The primaries of *E. aurantia* are of similar structure, but differ in having only two branches to the subcostal, both of them being emitted before the end of the cell; in other species, such as *E. argentea* &c., there is a third small subcostal branch near the apex. In the front legs of the male the trochanter is inserted about the middle of the coxa, the femur = $\frac{1}{2}$ coxa and is slightly dilated towards the distal end, the tibia = $\frac{2}{3}$ coxa; tarsus = femur. The terminal joint of the tarsus of the female (*E. aurantia*) = second + third joints; it has a setose pad on the under surface; the third and fourth joints terminate beneath with two strong spines. The terminal joint of the palpi is short and oval; the second joint is nearly four times as long as the first joint; the basal and second joints are subequal, the latter being the stouter of the two. The antennæ have thirty-six joints, the terminal ten forming a very distinct club. The secondary sexual organs in *E. aurantiaca* have the tegumen with its two lateral hooks of the usual shape, but in addition there is a long dependent lobe from the base of the lateral margin, slightly serrated on its outer surface towards its extremity. The harpagones are subtriangular and simple, setose on the lower edge and towards the outer angle. The penis is short and stout, and there is apparently no strap connecting it with the base of the harpagones. These organs, in *E. aurantia*, are quite

* W. H. Edwards, Trans. Am. Ent. Soc. ix. p. 36 (1881).

similar, except that the harpagones are rather more pointed and the dependent lobes of the tegumen are serrate at the extremities.

All the species of this genus have the habit of resting on the under surface of leaves within a few feet of the ground.

a. Subcostal nervure of primaries with four branches.

1. **Eurygona aurantiaca.** (Tab. XXXIX. figg. 1, 2 ♂; XLIII. figg. 9, 10 ♀.)

Eurygona aurantiaca, Godm. & Salv. Ann. & Mag. N. H. ser. 4, ii. p. 149¹.

Alis fulvo-aurantiis, dimidio distali anticarum et angulo posticarum apicali fusco-nigris; subtus albidis fascia indistincta ultracellulari fusca, margine externo late fusco, seriem macularum submarginalium albam extus nigro punctatam includente.

♀ alis russatis, anticis apice et margine externo fusco-nigris, fascia lata ultracellulari flavo-aurantia; subtus brunnescentibus fascia communi fusca transvittatis, maculis submarginalibus fere obsoletis.

Hab. GUATEMALA, San Gerónimo (*Hague*¹, *Champion*); NICARAGUA, Chontales (*Belt*).

Mr. Hague obtained us the first specimens of this species at San Gerónimo, where Mr. Champion subsequently found it in some numbers, his series including females and paired sexes. It was found frequenting a flowering tree on the bank of a small stream amongst second-growth woods. *E. aurantiaca* has also been found in Nicaragua, but in no intermediate locality. In the State of Panama *E. gyda*, an allied form, seems to take its place.

2. **Eurygona gyda.** (*E. russata*, Tab. XXXIX. figg. 3, 4 ♀.)

Eurygona gyda, Hew. Ex. Butt., Eurygona, t. 8. f. 79¹.

Eurygona russata, Godm. & Salv. P. Z. S. 1878, p. 361².

Alis flavo-aurantiis, anticis costa, apice et margine externo fusco-nigris; subtus argenteis, lineis transversis valde indistinctis notatis, puncto nigro ad medium marginis externi aliisque minoribus ad angulum analem.

♀ alis fusco-nigris, anticis plaga magna discali flavo-aurantia, posticis area interna rufescente; subtus argenteo-fuscis, fascia indistincta communi fusca; posticis punctis triangularibus nigris submarginalibus albo limbatis.

Hab. PANAMA, Chiriqui (*Arcé*), Volcan de Chiriqui (*Champion*).—ECUADOR¹.

Of this species we possess a pair from Chiriqui and a single male from Sarayacu in Ecuador. It differs in several points from *E. aurantiaca*, the black margin of the primaries being more restricted, there being no black spot at the apex of the secondaries; the colour of the wings is yellower above and more silvery beneath. The females differ still more widely.

The type of *E. gyda*, Hew., is said to have come from Brazil; but of the two specimens now in the Hewitson collection under this name, one is marked as coming from Ecuador and the other from Panama. They agree with our examples, but neither of them is the type, which has probably been given away in exchange or destroyed.

b. Subcostal nervure of primaries with three branches.

3. *Eurygona argentea*.

Eurygona argentea, Hew. Trans. Ent. Soc. 1871, p. 166¹; Ex. Butt., *Eurygona*, t. 10. f. 98, 99, 100².

Alis obscure fuscis, anticis infra cellulam rufis a basi usque ad alæ medium, posticis fascia rufo-aurantia a basi ad marginem externum; subtus argenteo-albidis, anticis fasciis quatuor transversis et margine externo fuscis; posticis fasciis sex transvittatis omnibus ad angulum analem transeuntibus extima macula nigra parva notata, margine externo nigro maculam magnam aurantiacam gerente.

♀ mari similis, sed anticis macula magna aurantiaco-flava notatis, altera parva ad medium posticarum, et macula parva ejusdem coloris in margine externo prope angulum analem.

Hab. NICARAGUA, Chontales¹ (*Belt*²).

We have only a female specimen of this species, doubtless one of the types from Belt's collection. The descriptions given above are taken from Hewitson.

This species is quite unknown from any other part of Central America.

4. *Eurygona crotopus*. (Tab. XL. figg. 7, 8 ♀.)

Papilio crotopus, Cram. Pap. Ex. t. 336. f. E, F¹.

Eurygona crotopus, Bates, Journ. Linn. Soc. Zool. ix. p. 422².

Alis nigro-brunneis, posticis certa luce purpureo suffusis; subtus fuscis linea communi ultracellulæ et altera extra eam rufescentibus, macula nigra ad angulum anticarum analem; posticis serio submarginali ocellorum nigrorum rufo-ciliatis.

♀ alis fuscis, anticis area discali linea lata olivacea pallide fusca notatis, posticis eodem modo obsolete notatis; subtus mari similis, sed alis pallidioribus, et minus distincte notatis.

Hab. PANAMA, Bugaba (*Champion*), Veraguas (*Arcé*).—AMAZONS²; GUIANA^{1 2}.

The form of this *Eurygona*, found sparingly in the State of Panama, agrees with that of the Upper Amazons, there being no distinct fulvous patch on the disk of the primaries. Mr. Champion captured his specimens in the forest of the hot country.

5. *Eurygona procula*, sp. n. (Tab. XXXIX. figg. 15, 16 ♂, 17, 18 ♀.)

Alis fusco-nigris, posticis dimidio interno umbrino-brunneis; subtus fuscis, fascia communi lata ultracellulæ (in posticis refracta) rufa nigricante limbata; anticis fascia altera extra eam; posticis ocellis ochraceis submarginalibus notatis, eo ad medium maximo et extus albo ornato, iis ad angulum analem elongatis.

♀ alis fuscis magis rotundatis, subtus fere ut in mare.

Hab. COSTA RICA, Cache (*Rogers*).

Mr. Rogers procured us two specimens of this species, the male being much injured. It has no near ally that we are acquainted with.

6. *Eurygona athena*. (Tab. XXXIX. figg. 21, 22 ♂.)

Eurygona athena, Hew. Equat. Lep. p. 46¹; Ex. Butt., *Eurygona*, t. 9. f. 91, 92².

Alis fuscis, posticis triente apicali aurantia; subtus griseo rufescentibus, fascia communi ultracellulæ rufa fusco limbata a costa anticarum ad marginem posticarum internum in posticis refracta; anticis fascia altera extra eam, oculo magno ad medium marginis posticarum externi et punctis ad angulum analem.

♀ adhuc ignota.

Hab. PANAMA, Calobre (*Arcé*).—ECUADOR^{1 2}.

A single male specimen in bad condition is the only Central-American one we have seen. It agrees fairly well with Hewitson's figure of Buckley's examples from Santa Inez in Ecuador. A larger series of better specimens may prove that the Central-American insect is distinct.

7. *Eurygona amphidecta*. (Tab. XL. figg. 5, 6 ♂.)

Eurygona amphidecta, Godm. & Salv. P. Z. S. 1878, p. 361¹.

Supra *E. eubule* valde similis, maculis anticarum ochraceo-fulvis absentibus, colore rufo-brunneo angulum analem haud attingente; alis subtus fere unicoloribus, linea communi minus sinuata, posticarum margine externo distincte serrato distinguenda.

♀ nobis ignota.

Hab. PANAMA, Chiriqui (*Ribbe*¹), Bugaba (*Champion*).—COLOMBIA.

The serrated margin of the secondaries distinguishes this *Eurygona* from all the species allied to it by the colour of the wings above. It was discovered by Herr Ribbe at Chiriqui, and described by us from specimens submitted to us by Dr. Staudinger.

Mr. Champion has since secured a specimen at Bugaba, and Herr Trötsch found it in Western Colombia. It has therefore a wider range than some of its congeners, though it is by no means abundant anywhere.

8. *Eurygona eubule*. (Tab. XL. figg. 13, 14 ♂, 15 ♀.)

Eurygona eubule, R. Feld. Verh. k.-k. zool.-bot. Ges. Wien, 1869, p. 467¹.

Eurygona hypophæa ♀, Salv. & Godm. P. Z. S. 1878, p. 360².

Alis fusco-nigricantibus, anticis area interna rufo-brunnea macula cellulari et duabus medianis ochraceo-fulvis; posticis (marginibus costali et externo exceptis) rufo-brunneis; subtus fuscis triente apicali dilutiore et a parte obscuriore linea fusco-nigra valde sinuosa divisa; posticis serie ocellorum submarginalium notatis.

♀ alis fuscis triente apicali dilutiori, anticis maculis tribus albidis notatis; subtus omnino pallidioribus et maculis sicut supra notatis.

Hab. MEXICO (*Hedemann*¹), Cordova (*Rümeli*), Jalapa (*Höge*); COSTA RICA (*Endres*²); PANAMA, Volcan de Chiriqui (*Champion*).

We possess specimens of this species from Southern Mexico, whence Lieut. Hedemann procured his type. These do not differ materially from others obtained by Mr. Champion on the slopes of the Volcan de Chiriqui.

As Felder says¹, the nearest relative of *E. eubule* is *E. euplæa*, Hew., from Brazil.

The female described by us in 1878² as the female of *E. hypophæa* most likely belongs here, but the colour of the wings is rather greyer below than those of a female from Dr. Staudinger's collection, concerning which we have no doubts. The white spots too are much larger. This example was contained in a collection made by the late E. R. Endres in Costa Rica, but it is in bad condition.

9. **Eurygona hypophæa.** (Tab. XL. figg. 9, 10 ♂.)

Eurygona hypophæa ♂, Godm. & Salv. P. Z. S. 1878, p. 360¹.

Alis fusco-nigricantibus medialiter rufescentibus; subtus fuscis fascia communi lata ultra cellulam indistincta; posticis serie submarginali punctorum nigrorum fere obsoleta.

♀ alis fuscis, anticarum area interna et posticis pallidioribus.

Hab. PANAMA, Chiriqui (*Ribbe*¹), Volcan de Chiriqui, Bugaba (*Champion*).

In describing the male of this species from a specimen in Dr. Staudinger's collection, we associated with it a female from Costa Rica which had long been undetermined in our collection. We now find that we were in error in so doing, and that the true female of *E. hypophæa* is as described above, and that the other specimen is very probably a female of *E. eubule*, though, as will be seen in our remarks on that species, we are not quite certain on this point. That the specimen described by us as the female of *E. hypophæa* is that sex of *E. eubule* we have now no doubt whatever.

E. hypophæa seems restricted in its range to the neighbourhood of Chiriqui. It flies in the early morning between 8 and 9 o'clock, and is found in second-growth woods.

10. **Eurygona leucorrhœa.** (Tab. XL. figg. 11, 12 ♂.)

Eurygona leucorrhœa, Godm. & Salv. P. Z. S. 1878, p. 360¹.

Alis fusco-nigris, anticis (præter aream costalem, apicem et marginem externum) et posticis omnino rufo-brunneis; subtus sericeo-fuscis, triente anticarum distali et area apicali posticarum obscurioribus; posticis dimidio distali sericeo-albido; linea communi ultra cellulas a costa anticarum ad marginem posticarum internum ducta, in posticis sinuata ad marginem externum plus minusve parallela; posticis serie submarginali ocellorum, eo ad medium marginis maximo, margine ipso rufo.

♀ nobis adhuc ignota.

Hab. PANAMA, Chiriqui (*Ribbe*¹), Volcan de Chiriqui, Bugaba (*Champion*).

This *Eurygona* is restricted to the neighbourhood of the Volcano of Chiriqui, whence Mr. Champion sent us a series of many specimens. The first that came under our notice were obtained by Herr Ribbe, and were submitted to us by Dr. Staudinger. One of these we have figured.

The species most nearly allied to *E. leucorrhœa* is *E. eucrates*, Hew., from Ecuador; this has a wider dark edging to the outer margin and a dark triangular mark on the outer margin of the secondaries not seen in *E. leucorrhœa*.

This species has the same habits as *E. hypophæa*.

11. **Eurygona sergia**, sp. n. (Tab. XXXIX. figg. 9, 10 ♂, 11, 12 ♀.)

Alis fusco-nigris, anticis triente basali (præter costam) et posticis area abdominali rufo-brunneis; subtus griseo-fuscis, fascia communi ultra cellulas rufa nigro marginata, a costa anticarum ad marginem posticarum internum ducta; anticis fascia altera exteriori obscura; posticis ad marginem externum nigro variegatis et ocellis submarginalibus ornatis, eo ad medium maximo, iis ad angulum analem elongatis.

♀ mari similis, sed colore alarum rufo-brunneo dilutiore.

♀ altera (?) alis supra fuscis inornatis.

Hab. GUATEMALA, Polochic valley (*Hague*), Panima (*Champion*); COSTA RICA, San Francisco, Cache (*Rogers*); PANAMA, Bugaba (*Champion*).

This species is undoubtedly closely allied to *E. mys*, concerning the variations of which there seems to be some confusion, judging from Hewitson's figures of it. From the true *E. mys*, as figured by Herrich-Schäffer, the *Eurygona* we now describe differs in the greater extension of the rufous-brown colour on the primaries, as well as on the secondaries, which in *E. mys* is restricted to a small basal spot on the primaries and a comparatively narrow portion of the abdominal area of the secondaries, the inner margin being distinctly defined. There is some variation in our series of *E. sergia*, but the above points seem fairly constant. In South America we do not find *E. sergia*, as none of the so-called varieties of *E. mys* agree with it.

A female from Costa Rica, which agrees with the normal female from the same country on the underside, differs above in being wholly without the red-brown colour of the wings. We believe we are correct in assigning it to *E. sergia*, such variation in the females being of not unfrequent occurrence in members of this genus.

In the State of Panama *E. sergia* is very abundant, and we trace it northwards to Guatemala, where, however, it is not nearly so common. It has the same habits as the preceding species.

12. *Eurygona hieronymi*. (Tab. XXXIX. figg. 13, 14 ♂.)

Eurygona hieronymi, Godm. & Salv. Ann. & Mag. N. H. ser. 4, ii. p. 149¹.

Alis fusco-nigris, posticis margine interno rufo-brunneo; subtus griseo-fuscis, et omnino ut in *E. sergia* notatis. ♀ alis omnino fuscis, inornatis; subtus mari similibus, sed dilutioribus.

Hab. GUATEMALA, San Gerónimo (*Hague*¹, *Champion*), Tocoy, Cubilguitz (*Champion*).

This is also allied to *E. mys*, and even more closely resembles Herrich-Schäffer's figure than *E. sergia*. It differs in having the primaries uniform rufous brown without any rufous spot, and in the inner margin of the secondaries being more narrowly edged with that colour.

Our first specimens were sent us by Mr. Hague from San Gerónimo, where Mr. Champion also found it, including a pair taken together. It is evidently a scarce species of very restricted range. Mr. Champion's specimens were taken on the banks of small streams amongst second-growth woods.

13. *Eurygona inconspicua*. (Tab. XXXIX. figg. 19, 20 ♀.)

Eurygona inconspicua, Godm. & Salv. P. Z. S. 1878, p. 361¹.

♀ alis fuscis unicoloribus, subtus albidis cervino tinctis; fascia communi per cellulæ finem rufa a costa anticarum ad marginem posticarum internum ducta; anticis fascia altera extra eam, margine externo fusco; posticis serie submarginali punctorum nigrorum, eo ad medium maximo, iis ad angulum elongatis. ♂ adhuc ignotus.

Hab. COSTA RICA, Cache (*Rogers*¹); PANAMA, Chiriqui (*Ribbe*).

We have hitherto been unable to find the male of this *Eurygona*, the species apparently being quite a distinct one. The two females originally described are the only ones we have seen.

14. ***Eurygona pusilla*.** (Tab. XL. figg. 16, 17.)

Eurygona pusilla, R. Felder, Verh. k. k. zool.-bot. Ges. Wien, 1869, p. 467¹.

♀ alis fusco-nigricantibus, anticis area discali flavido-rufa, posticis fere omnino rufo-brunneis; subtus glauco-albis linea communi, in posticis flexuosa, rufa; anticis triente apicali fusca lunulas albas includente; posticis ad marginem externum punctis nigris notatis, eo ad medium maximo.

Hab. MEXICO, Potrero (*Hedemann*¹); BRITISH HONDURAS, Corosal (*Roe*).

We have a single female specimen from British Honduras, which we have little hesitation in assigning to this species, described from a male obtained by Lieut. Hedemann at Potrero in Southern Mexico. Felder, in his description, compares *E. pusilla* with *E. teleclus*; but the differences are very great, not only from it, but from all other species of *Eurygona* with which we are acquainted.

15. ***Eurygona regipennis*.** (Tab. XL. fig. 1, 2 ♂, 3, 4 ♀.)

Eurygona regipennis, Butl. & Druce, Cist. Ent. i. p. 103¹; P. Z. S. 1874, p. 352².

Eurygona eurysthenes, Hew. Cat., partim³.

Alis nigris, costa luce purpurea nitentibus, posticis ad marginem internum intense nigris; subtus pallide fuscis, fascia mediana alba, introrsum rufo late limbata, extrorsum rufo-fusco; posticis ocellis ad marginem externum ochraceo cinetis, extus albo limbatis, eo ad medium maximo, et intus purpureo nitente, iis ad angulum analem distortis et elongatis.

♀ alis fuscis, fascia communi lata alba anticarum costam haud attingente ad marginem internum posticarum ducta; subtus mari similis, fascia alba latiori.

Hab. GUATEMALA, Teleman (*Champion*); COSTA RICA (*Van Patten*^{1 2}), Cache (*Rogers*); PANAMA (*Mus. Hewitson*³).

Of this beautiful species we have the type, a male in rather poor condition and a female, both from Costa Rica, and also another female from Guatemala, the only one obtained by Mr. Champion.

The female on the upper side recalls *E. eubages*, Hew., but the markings of the under surface show that it has no near relationship with that species.

In the neighbourhood of Chiriqui its place is perhaps taken by *E. eupepla*, the females being very similar. The males, however, differ essentially on the underside.

A female from Panama in the Hewitson collection stands under the name of *E. eurysthenes*³.

16. ***Eurygona eupepla*,** sp. n. (Tab. XLIII. figg. 5, 6 ♂, 7, 8 ♀.)

Alis supra iis *E. regipennis* similibus, lætissime purpureis, posticis plerumque nigerrimis margine externo tantum purpureo; subtus ochraceo-fulvis, fascia communi ultracellulari rufa in posticis refracta; anticis fascia

BIOL. CENTR.-AMER., Rhopal., Vol. I., December 1885.

3 B

altera extra eam; posticis ocello magno ad medium marginis externi rufo ciliato, albo extus limbo et intus purpureo nitente, lineis variis rufis plus minusve elongatis ad marginem auaalem.
 ♀ feminae *E. regipennis* persimilis, fascia alarum alba subtus minus distincte rufo limbata.

Hab. PANAMA, Bugaba (*Champion*).

Mr. Champion procured us a male and two females of this beautiful species in the forest west of Bugaba. The male differs from that of *E. regipennis* in the rich colouring of its underside, the females of the two species being hardly distinguishable.

c. Subcostal nervure of primaries with two branches*.

17. **Eurygona bettina.** (Tab. XL. figg. 23, 24.)

Eurygona bettina, Hew. Equat. Lep. p. 46¹; Ex. Butt., Eurygona, t. 9. f. 85².

Alis fusco-nigris cyaneo vix tinetis, anticis ad apicem paulo dilutioribus; subtus pallide aureis unicoloribus, macula parva ad medium marginis posticarum externi nigra maculisque duabus minoribus ad angulum analem.

♀ mari similis, sed alis omnino dilutioribus.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA, Cache (*Rogers*).—ECUADOR¹.

Originally described from Ecuador, where Buckley obtained it in some numbers¹. In Central America it seems to be rare, and as yet we have only seen specimens from Costa Rica and Nicaragua. From the latter country Belt sent a single male specimen.

E. bettina may readily be distinguished from the species it resembles on the upper side by the pale golden tint of the wings beneath.

18. **Eurygona cataleuca.** (Tab. XL. figg. 21, 22.)

Eurygona cataleuca, R. Felder, Verh. k. k. zool.-bot. Ges. Wien, 1869, p. 467¹.

Alis sericeo-fusco-nigris, anticis ad apicem dilutioribus, subtus omnino argenteis immaculatis.

Hab. MEXICO, Cordova, Potrero (*Hedemann*¹), Cordova (*Rümel*); GUATEMALA, Cubilguitz (*Champion*).

This species seems to come next to *E. eumenes*, Hew., of Colombia and the valley of the Amazons, but differs in the wings being destitute of all markings beneath. It was first obtained by Lieut. Hedemann in Southern Mexico, where it has since been found by Rümel. Its presence in Guatemala is proved by a single male specimen caught by Champion in the forest country of northern Vera Paz.

19. **Eurygona aurantia.** (Tab. XL. figg. 18, 19 ♂, 20 ♀.)

Eurygona aurantia, Butl. & Druce, Cist. Ent. i. p. 103¹; P. Z. S. 1874, p. 353².

Alis fusco-nigris, area interna plaga magna subtriangulari rufo-aurantia; subtus omnino argenteis immaculatis; abdomine supra medialiter rufo-aurantio.

♀ fuscis anticis tantum plaga aurantia ornatis.

* The drawing of the wings of the species mentioned below is incorrectly given.

Hab. COSTA RICA (*Van Patten*^{1 2}); PANAMA, Volcan de Chiriqui, Bugaba (*Champion*), Chiriqui (*Ribbe*).

The original specimens of this pretty species formed part of Van Patten's Costa Rica collection, and are the only ones we have seen from that country; but we have a large number from the neighbourhood of Chiriqui sent us by Mr. Champion, amongst which are several pairs captured together. It was found abundantly in second-growth wood, flying in the early morning.

20. ***Eurygona chrysippe*.** (Tab. XXXIX. figg. 5, 6 ♂, 7, 8 ♀.)

Eurygona chrysippe, Bates, Ent. Monthl. Mag. iii. p. 154¹; Journ. Linn. Soc. Zool. ix. p. 423²; Butl. & Druce, P. Z. S. 1874, p. 352³.

Eurygona labiena, Hew. Ent. Monthl. Mag. vi. p. 226⁴; Ex. Butt., *Eurygona*, t. 9. f. 89⁵.

Alis fusco-nigris, area interna omnino rufo-aurantia; subtus aurantiis posticis serie submarginali punctorum nigrorum; abdomine medially aurantio.

♀ mari similis, sed major, area alarum interna flavida distinguenda.

Hab. NICARAGUA, Chontales (*Belt*^{4 5}); COSTA RICA (*Van Patten*³); PANAMA, Santa Fé (*Arcé*^{1 2}).—COLOMBIA.

On the upper surface of the wings this *Eurygona* closely resembles *E. aurantia*, except that the inner orange patch of the wings is larger and leaves a narrower dark border; beneath, the two differ widely, *E. aurantia* being silvery and *E. chrysippe* orange.

In their range *E. chrysippe* is more widely diffused than *E. aurantia*, being found in Nicaragua and also in Colombia. Except in Costa Rica, where Van Patten obtained both species, they do not appear to be found together.

Specimens from the State of Panama were the types of Mr. Bates's description of *E. chrysippe*. Hewitson described examples from Nicaragua as *E. labiena*, but there can be no doubt both these names refer to one species.

METHONELLA.

Methonella, Westwood, Gen. Diurn. Lep. p. 533 (1852), vice *Methone*, p. 422.

There are but two closely allied species in this genus, one of which occurs in Costa Rica, Panama, and Colombia, the other in Surinam and the Amazons region.

The subcostal nervure of the primaries in *M. cecilia* emits two branches before and two beyond the end of the cell, the upper radial meets the subcostal beyond the end of the cell; the middle discocellular is perfect, and, running as a continuation of the lower radial, meets the subcostal some way beyond the second branch; the lower discocellular is atrophied towards the upper end, and meets the median at a large acute angle some way beyond the origin of the second branch; the costal side of the cell is a little shorter than the median side. The secondaries have no basal nervure; the

upper discocellular joins the subcostal some way beyond the first branch, and forms a continuation of the radial; the lower discocellular is atrophied towards its upper end, it meets the median beyond the second branch at a large acute angle; the costal side of the cell is much shorter than the median side.

The front legs of the male have a stout coxa; the trochanter is inserted about two thirds of its length from the base; the femur is short= $\frac{1}{2}$ coxa, dilated towards the distal end; the tibia is rather $<$ the coxa, dilated in the middle; the tarsus short and elliptical $<$ femur. The terminal tarsal joint of the female = the third + fourth; the third and fourth joints terminate beneath with a single strong spine. The terminal joint of the palpi is small and oval, = $\frac{1}{4}$ middle joint; the basal joint is a little shorter than the middle joint, and dilated towards its base. The antennæ have thirty-four joints, and terminate in a moderate club.

The males have the tegumen normal, except that there are two lateral hooks on each side instead of one. The harpagones are simple pointed lobes, setose outwardly and along the lower edge; above the penis in the middle of the anal cavity is a single spine directed outwards; the penis itself is truncate, but without a strap connecting it with the harpagones.

1. *Methonella chrysomela*. (Tab. XLI. figg. 1, 2 ♂, 3, 4 ♀.)

Methonella chrysomela, Butl. Cist. Ent. i. p. 78¹; Butl. & Druce, P. Z. S. 1874, p. 353².

Alis nigris, anticis plaga magna marginem interiorem attingento et posticis dimidio proximo rufo-aurantiis; subtus flavis, anticis marginibus costali et exteriori et fascia arcuata transversa fusco-nigris; posticis dimidio distali fusco-nigro series duas punctorum includente, interiori flava exteriori alba; ad basin et ad marginem interiorem aurantio lavatis; abdomine fere omnino aurantio.

♀ major, anticis fascia arcuata ad apicem plaga aurantia extus flava notata, posticis margine nigro maculas tres flavas continente; cilia alba.

Obs. Anticarum maris apice interdum plaga elongata flava ornato.

Hab. COSTA RICA (*Van Patten*²), Cache, Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Champion*).—COLOMBIA¹.

By far the majority of male specimens of this species from Central America and Colombia have the apex of the primaries uniform black, but we have two examples from Costa Rica which have a conspicuous spot there, as in *M. cecilia*; the colour, however, is yellow, and not orange. The two species may be further distinguished by the secondaries in *M. cecilia* having a confluent yellow band running parallel to the outer margin inside the submarginal row of white spots. In *M. chrysomela* this band is broken up into distinct spots.

Mr. Butler described the male of this species from a Costa-Rican specimen in Mr. Druce's collection, others being known to him from Colombia¹. We have since obtained a good series of examples, including females, both from Costa Rica and the State of Panama. Mr. Champion found it in dense forest, at an elevation of about 3000 feet.

HADES.

Hades, Westwood, Gen. Diurn. Lep. p. 435 (1851).

Moritzia, Feld. Wien. ent. Mon. v. p. 100.

Two species are included in this genus—one, *H. noctula*, of wide range, as given below; the other, *H. hecamede*, as yet only known from Ecuador. The description of the genus was based upon a single female specimen obtained by Dyson in Colombia, and Professor Westwood was unable to indicate its position. In Mr. Bates's arrangement it stands between *Cyrenia* and *Necyria*, but with neither genus has it much real affinity, nor have they with one another. One peculiarity of *Hades* lies in the number of subcostal branches, which is four in the male and three in the female; this is not the case in either of the genera referred to; and the secondary male organs are of a simple structure, very different from the complicated arrangement of those in *Necyria*, *Cyrenia* again having peculiarities of its own.

The subcostal nervure of the primaries of the male emits two branches before the end of the cell and two a long way afterwards, in the female only one close to the apex. The upper radial meets the subcostal beyond the cell; the middle discocellular is perfect, and forms a curved line with the lower radial; the lower discocellular meets the median some way beyond the origin of the second branch. The costal side of the cell is considerably shorter than the median side. There appears to be no basal nervure to the secondary wings in either sex; the upper discocellular of the secondaries is well defined, the lower atrophied meeting the median some way beyond the origin of the second branch. The costal side of the cell is much shorter than the median side.

The front legs of the male have the trochanter inserted in the coxa about two thirds of its length from its base; the femur is short and stout, a little shorter than the tibia; the tarsus is about the same length as the femur and there is a strong terminal seta, very probably not always present. The front legs of the female have the terminal tarsal joint rather long, with a setose pad on the under surface; the third and fourth joints have each a spur on its under surface. The terminal joint of the palpi is very short and elliptical; the second joint is swollen towards its proximal end, and is about three times the length of the terminal joint; the basal joint dilated = $\frac{3}{4}$ second joint. The antennæ have about fifty joints, whereof the terminal nine or ten form a somewhat abrupt club.

The secondary male organs have a bilobed tegumen, each lobe being covered externally with numerous setæ; on the ventral edge on either side is a strong hook directed outwards; the harpagones are simple lobes, setose at the extremity and along their dorsal and ventral edges. The penis is short and stout; there is no strap connecting it with the base of the harpagones, but above it is a projecting piece directed outwards and forked towards its end.

1. *Hades noctula*.

Hades noctula, Westw. in Doubl. & Hew. Gen. Diurn. Lep. p. 435, t. 72. f. 3¹; Bates, Journ.

Linn. Soc. Zool. ix. p. 427²; Boisd. Lép. Guat. p. 25³; Butl. & Druce, P. Z. S. 1874, p. 353⁴.

Moritzia paradoxa, Feld. Wien. ent. Monatschr. v. p. 100⁵.

Alis fumoso-nigris, ciliis albis; subtus ad basin aurantiis, extus inter venas albido biradiolatis.

♀ mari similis, sed alis fusciscentioribus et supra interdum indistincte albido radiolatis.

Hab. MEXICO, Cordova (*Rümeli*); GUATEMALA³, Polochic valley (*Hague*), Chiacam, Pantaleon, San Isidro, Cerro Zunil (*Champion*); HONDURAS³; COSTA RICA (*Van Patten*⁴), San Francisco, Cache (*Rogers*); PANAMA, Volcan de Chiriqui, Bugaba, David (*Champion*), Calobre (*Arcé*).—COLOMBIA^{1 3}; VENEZUELA⁵.

The likeness of this curious species to the Mexican Nymphalid *Morpheis ehrenbergi* is remarkable, and since writing on that species (*antea*, p. 211) we find that the two are found, if not actually in the same district, at least in close proximity, a fact we were not aware of at that time.

If these two forms assumed the similar colouring of the wings by mimicry, they must have for a long time coexisted in the same area. Their distribution now would show either that the *Morpheis* has been largely exterminated, or that the *Hades* has vastly extended its range.

At San Isidro in Guatemala, Mr. Champion found this species in great numbers in cacao-plantations, under the forest trees, at an elevation of about 1500 feet. It settles beneath leaves like so many of this family. It was equally common near Chiriqui.

Subfam. *ERYCININÆ**.

Secondaries with a well-developed basal nervure.

A. Subcostal nervure of primaries with four branches †.

EURYBIA.

Eurybia, Hübner, Verz. bek. Schmett. p. 17 (1816); Westw. Gen. Diurn. Lep. p. 416.

Eurybia is a strictly Tropical American genus, containing ten or twelve species, its most northern limit extending to Southern Mexico. Five species occur within our borders, none of which (excepting the somewhat doubtful *E. unxia*) are peculiar.

The specific characters of most of the members of *Eurybia* are not very constant, and the variations of both colour and size between individual specimens render the species difficult to define with precision.

Setting aside the Brazilian *E. carolina* and *E. pergæa*, which may be distinguished by their uncinatè primaries, the remainder of the species may be divided by the

* This is Mr. Bates's subfamily Erycininæ, with the addition of *Alesa*, *Eurybia*, *Eunogyra*, *Mesosemia*, *Cremna*, and *Hyphilaria* removed from his subfamily Nemeobiinæ.

† *Comptoseria* also comes into this section, in addition to the genera mentioned in the preceding note.

presence or absence of an ocellus at the end of the cell of the primaries. A blue sheen over the wings serves as a basis for another division.

The subcostal nervure of the primaries of *Eurybia halimede* emits two branches before the end of the cell and two beyond it; the lower and middle discocellulars are atrophied only towards their junction with the lower radial; the upper radial and the middle discocellular meet the subcostal at the same point, the latter at a small acute angle; the lower discocellular meets the median nervure some way beyond the origin of the second branch also at an acute angle; the costal and median sides of the cell are subequal. The secondaries have a strong basal nervure; the upper discocellular is not atrophied, it leaves the subcostal a little before the first branch, and runs in an almost continued curve with the radial; the lower discocellular is atrophied towards its junction with the radial and meets the median some way beyond the origin of the second branch, the median itself being somewhat abruptly bent at the point of junction; the costal side of the cell is much shorter than the median side.

The front legs of the male have a slender coxa; the femur is short, somewhat dilated towards its distal end; the tibia > femur, also dilated towards its distal end; the tarsus is single-jointed, nearly = 2 tibia, is much swollen and club-shaped for about two thirds of its length. The terminal joint of the tarsus of the front leg of the female is longer than either of the three preceding joints; the first, second, third, and fourth joints all terminate with two strong spines. The palpi have a very small, nearly spherical terminal joint; the middle joint is at least eight times as long as the first; basal joint dilated, = $\frac{1}{3}$ middle joint. The antennæ have forty-three joints, and taper very gradually towards a small elongated club.

The tegumen has a double lobe, setose on the outer surface towards the extremity, and with two strong lateral hooks. The harpagones have two long strong spines which diverge from one another outwardly; the upper spine is setose on its under surface towards the base; the under spine has a pencil of longer hairs about the middle of its length. The penis is strong and pointed, and a strap curved outwardly connects its base with the base of the harpagones.

a. An ocellus at the end of the cell of the primaries.

a'. No blue on the secondaries.

1. *Eurybia patrona*. (Tab. XXXVIII. figg. 1, 2.)

Eurybia patrona, Weymar, Stett. ent. Zeit. 1875, p. 368, t. 1. f. 2¹.

Eurybia persona, Staud. Verh. k. k. zool.-bot. Ges. Wien, 1875, p. 109².

Eurybia juturna, Butl. & Druce, P. Z. S. 1874, p. 352³.

Alis supra fuscis, anticis ocello ad cellulæ finem cyaneo, fulvo circumcincto, fascia valde obscura transversa ultra cellulam et altera submarginali fulvescentibus; posticarum dimidio distali testacco-rufo seriebus duabus macularum nigrarum submarginalium, ea interiori elongata; subtus alis dilutioribus, maculis

submarginalibus fulvo indistincte circumcinctis nigris, anticarum ocello sicut supra; posticis puncto nigro, fulvo marginato ad cellulæ finem.

Hab. GUATEMALA, Poctun (*F. D. G. & O. S.*); COSTA RICA (*Van Patten*³); PANAMA, Volcan de Chiriqui (*Ribbe*²), Bugaba (*Champion*), Lion Hill (*M'Leannan*).—COLOMBIA¹.

Herr Weymar's description of this species was published in the middle of April 1875, whilst that of Dr. Staudinger was read before the Vienna Society on the 7th of the same month, and the actual publication of the name must have taken place after some lapse of time; hence we adopt the name *E. patrona*, Weymar, for this species.

The insect most nearly allied to this species seems to be *E. juturna*, Feld., of which we have specimens so named from the Lower Amazons and also from Eastern Peru. From these, *E. patrona* differs in its larger size and in the greater extension of the rufous colour on the outer portion of the secondaries; in the ocellus of the primaries the blue spot is more conspicuous and of a brighter tint. Our only Guatemalan specimen was taken by Salvin in an open savanna near Poctun, in the department of Peten. From Costa Rica we have several examples, and Mr. Champion captured a single example at Bugaba, where Dr. Staudinger's types were taken; we have several from the line of the Panama Railway, and one from Colombia, whence Herr Weymar's type was derived.

E. patrona is the largest species of the genus in Central America, and equals in size *E. donna* of Colombia.

Mr. Champion took his specimen in dense undergrowth in damp places.

2. *Eurybia salome*.

Papilio salome, Cram. Pap. Ex. t. 12. f. G, H¹.

Eurybia salome, Bates, Journ. Linn. Soc. Zool. ix. p. 415².

E. patronæ similis, sed multo minor; anticarum ocello saturatiori cæruleo, anticis punctis binis ad costam ultracellulam albis.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Lion Hill (*M'Leannan*), Panama city (*J. J. Walker*).—ECUADOR; AMAZONS²; GUIANA¹.

We have a Panama example of this butterfly which agrees accurately with others from the Lower Amazons and Guiana, and these again conform to Cramer's figure.

As a species, it seems to be fairly separable from *E. patrona*; the two small white subcostal spots on the primaries are present in all our specimens, their absence being equally plain in the allied form. At the same time the value of these spots as a definite character is somewhat questionable, for they fail to differentiate *E. lycisca* from *E. lamia*, as certain undoubted specimens of the former have them, whilst others do not.

b'. Secondaries suffused with blue.

3. *Eurybia unxia*, sp. n.

E. salome et *E. upis* affinis, sed posticis cæruleo lavatis forsan distinguenda.

♀ cæruleo inornata.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA, Cache (*Rogers*); PANAMA, Chiriqui, Calobre (*Arcé*).

This form of *Eurybia* is certainly very closely allied to *E. upis*, Hübner, but seems separable by reason of the blue shade which overspreads the secondary wings when held in a certain light. It is also distinguished from *E. salome* by the absence of the brick-red colouring of the outer portion of the secondaries.

Our specimens are chiefly from Costa Rica; those from the State of Panama have the blue of a rather more purple hue.

4. *Eurybia lycisca*.

Eurybia lycisca, Doubl. & Hew. Gen. Diurn. Lep. p. 417, t. 69. f. 4¹; Bates, Journ. Linn. Soc. Zool. ix. p. 415²; Boisd. Léop. Guat. p. 20³.

Alis fusco-nigris, anticis transversim obsolete fasciatis, ocello ad cellulæ finem cæruleo fulvo ciliato; posticis, præter costam et marginem externum anguste, lætissime cæruleis; subtus alis fuscis, ocello ut supra, fasciis anticarum magis distinctis et fere lunulatis; posticis maculis submarginalibus intus fulvo marginatis.

♀ mari similis, colore posticarum cæruleo paulo dilutiore.

Hab. GUATEMALA, Quirigua (*F. D. G. & O. S.*), Choctun, Chisoy valley (*Hague*), Panima, San Juan in Vera Paz (*Champion*); HONDURAS^{1 3}; NICARAGUA, Chontales (*Belt*); COSTA RICA, Irazu (*Rogers*); PANAMA, Bugaba, David (*Champion*), Lion Hill (*McLeannan*).—COLOMBIA; ECUADOR; VENEZUELA; GUIANA; BRAZIL³.

This *Eurybia* differs from *E. lamia* in having the blue colour restricted to the secondaries, and in general, but not always, in the absence of two white subcostal spots on the primaries, always present, so far as we know, in *E. lamia*.

As will be seen above, *E. lycisca* has a wide range, and is fairly constant in its markings at least in Central America; our Venezuelan and Guiana examples are much smaller than usual, though one of our Nicaraguan specimens is about equal to them in size. In Nicaragua too there seems to be more variation in colour than elsewhere, for in a male specimen in our series, which in other respects seems to be *E. lycisca*, the characteristic blue of the secondaries is wholly absent, and in a female it is only faintly seen. These can hardly belong to another species; for the present, at least, we treat them as aberrations from the normal type.

Our specimen from Quirigua was captured in the forest where the wonderful Indian ruins stand, not far from the bank of the Motagua river. Mr. Champion's specimens were taken in dense undergrowth.

b. No ocellus at the end of the cell of the primaries.

5. *Eurybia halimede*.

Limnas subtilis halimede, Hübn. Samml. ex. Schmett. i. t. 27¹.

Eurybia halimede, Bates, Journ. Linn. Soc. Zool. ix. p. 415².

Alis fuscis, serie duplici macularum submarginalium, exteriori punctis nigris fulvo marginatis, interiori punctis in anticis albo in posticis testaceo pupillatis, anticis ad cellulæ finem maculis indistinctis notatis sed ocello sicut in *E. salome* etc. haud ornatis.

Hab. MEXICO, Cordova (*Höge*); GUATEMALA, Polochic river (*Hague*), Panima, Mirandilla, San Isidro, Cerro Zunil (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA, Cache (*Rogers*); PANAMA, Volcan de Chiriqui, Bugaba, David (*Champion*), Calobre (*Arce*), Panama city (*J. J. Walker*).—COLOMBIA; AMAZONS²; BRAZIL².

This is perhaps the commonest species of *Eurybia* in our country, and may be distinguished from all its allies by the absence of the ocellus on the primaries, though its position is indicated by some dark marks.

As will be seen above, its range is very extensive. Mr. Champion obtained many specimens both in Guatemala and in the State of Panama, and captured it in shady forests as high as 4500 feet on the slopes of Zunil. It was equally common in the low-lying hotter districts.

MESOSEMIA.

Mesosemia, Hübn. Verz. bek. Schmett. p. 20 (1816); Westwood, Gen. Diurn. Lep. p. 453.

This is also a strictly tropical genus, containing upwards of one hundred species which are spread from South Mexico to South Brazil. Sixteen species are found within our limits, whereof only two reach as far north as Southern Mexico; as we proceed southward the number of species increases, as we find thirteen between Nicaragua and the State of Panama. Ten out of the sixteen species are peculiar, and of the remaining six, three are not known to pass beyond the limits of Colombia, one reaches as far as Venezuela, and two Guiana, one of the latter being also found in Ecuador. It is somewhat singular that not a single one occurs in the Amazons valley so far as we know. In dividing out this genus we have used certain colour characteristics which will be found a convenient help in distinguishing the species. Underlying these we have little doubt other differences will be found; but our dissections at present only include three species.

The subcostal nervure of the primaries in *M. grandis* emit two branches before the end of the cell and two beyond it; the discocellulars are atrophied towards their junction with the lower radial; the middle discocellular and the upper radial meet the subcostal at the same point, the former at an acute angle; the lower discocellular meets the median some way beyond the origin of the second branch; the costal and median sides of the cell are subequal. The secondaries have a strong basal nervure; the upper

discocellular is not atrophied—it meets the subcostal a little beyond the origin of the first branch; the lower discocellular is atrophied near its junction with the radial—it meets the median some way beyond the origin of the second branch; the costal side of the cell is much shorter than the median side.

In *M. asa* the discocellulars of the primaries are rather more atrophied and less curved, the middle discocellular leaving the subcostal at a larger acute angle.

In *M. mollina* there is a very short upper discocellular running almost in a line with the radial, the middle and lower discocellulars are still more atrophied, and the upper stands almost at a right angle to the upper radial.

The front legs in the male of *M. grandis* have the extension of the coxa beyond the trochanter joint long and slender; the tibia is short and dilated towards its distal end; the tibia is $>$ femur + trochanter; the tarsus is $>$ tibia; there is a constriction near the end, the rudiment of a joint, and two short spines at the ends.

In *M. asa* the fore legs of the male are similar to those of *M. grandis*; but those of *M. mollina* differ widely, being similar to those of *Perophthalma tenera*, except that the tarsus is even more reduced in length, being hardly larger than the trochanter.

The fore leg of the female in *M. asa* has the terminal joint of the tarsus—the three preceding ones; the under surface has a densely setose pad; the first, second, third, and fourth tarsal joints each terminate with a strong spine.

The palpi in both *M. asa* and *M. grandis* have a small subspherical terminal joint, the middle joint being about six times as long, and gradually tapering towards the distal end; basal joint dilated = $\frac{1}{2}$ middle joint. The antennæ of *M. grandis* have thirty-seven joints, those of *M. asa* and *M. mollina* thirty-two. The eyes of all three species are slightly hairy.

The male secondary sexual organs have the usual bilobed setose tegumen with two long lateral spines. The harpagones are subtriangular, the angle directed outwards being setose; the lower edge is curved outwards slightly in the middle, the projecting piece being setose. The penis has a curved strap from the middle to the base of the harpagones.

In *M. asa* the projecting piece on the under surface of the harpagones is produced into a spine; in *M. mollina* the upper point of the harpagones becomes a lobe; the lower projection is still more produced than in *M. asa*.

a. Discal area of secondaries blue crossed by dark bands.

1. *Mesosemia telegone*. (Tab. XXXVIII. figg. 3 ♂, 4 ♀.)

Diophtalma telegone, Boisd. Sp. Gén. t. 21. f. 2¹.

Mesosemia telegone, Hew. Ex. Butt., Mesosemia, t. 1. f. 9, 10²; Bates, Journ. Linn. Soc. Zool. ix. p. 416³; Butl. & Druce, P. Z. S. 1874, p. 352⁴; Godm. & Salv. Trans. Ent. Soc. 1880, p. 124⁵.

Mesosemia lamachus, Hew. Ex. Butt., Mesosemia, t. 1. f. 3–6⁶.

Mesosemia amiana, Feld. Wien. ent. Monatschr. v. p. 100⁷ (?).

Alis fuscis, anticis ad basin pallidioribus margine interno ad basin (interdum) et posticis lavendulo-cæruleis, anticis oculo nigro albo pupillato et fulvo ciliato ad cellulae finem et juxta cum lineis transversim fuscis irregulariter notatis; posticis margine externo et lineis duabus transversis ultracellularibus fuscis; subtus pallide fuscis fascia communi irregulari mediana anticarum ocellum includente, intus irrorata et utrinque lineis fulvis et fuseis marginata, posticis oculo parvo quoque notatis; fasciis duabus alteris marginibus externis subparallelibus, exteriori nigro maculosa.

♀ mari similis, sed colore cæruleo posticarum nitentiore et lineis obscuris plerumque latioribus.

Hab. HONDURAS ⁶; NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten* ⁴), San Francisco (*Rogers*); PANAMA, Volcan de Chiriqui ¹, Bugaba, David (*Champion*), Calobre (*Arcé*), Lion Hill (*McLeannan*).—COLOMBIA ^{1 3 5}; VENEZUELA ⁷?

We are in some doubt if this is the true *M. telegone* of Boisduval, whose figure is anything but satisfactory, nor does Hewitson much mend matters, and adds a further complication by figuring an obvious female as a male. Two of Dr. Felder's *M. amiana* are before us, and we have little doubt that this name refers to the same species, though there is a slight difference in the female, which has much less blue on the secondaries.

On examination of Hewitson's specimens of *M. lamachus* in the British Museum, and of the specimens figured as *M. telegone*, we believe them to be referable to the same species.

Examples from Costa Rica have the bands of the secondaries unusually broad, and this is also seen in some Veraguas specimens, but it is not to be considered a specific character.

M. telegone differs from *M. methion* in having the blue of the secondaries in the male of one tint, whereas in the allied species the costal half is of a deep blue, and the rest of the wing much duller in tone.

This *Mesosemia* is one of the commonest of its genus in the country in which it is found.

2. *Mesosemia methion*, sp. n.

Mesosemia lamachus, Bates, Journ. Linn. Soc. Zool. ix. p. 416 ¹ (partim).

Diophtalma lamachus, Boisd. Léop. Guat. p. 20 ².

M. telegone certe affinis, sed posticis in mari bicoloribus dimidio costali obscure cæruleo, dimidio reliquo sordide purpurascete-cæruleo.

Hab. MEXICO ³, Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA ², Chisoy and Polochic valleys (*F. D. G. & O. S.*), Panima, Sinanja, Zapote, El Tumbador, Cerro Zunil, Las Mercedes (*Champion*).

This species is the northern form of *M. telegone*, taking its place in Mexico and Guatemala. From the former country there is a female specimen in the British Museum, and Boisduval mentions one from the same country under the name *M. lamachus*.

It is a common species in the low-lying forests of Guatemala on both sides of the mountain chain up to an elevation of about 3000 feet. It frequents the forest, hiding beneath leaves.

b. Both wings obscure blue, covered with dark transverse bands.

3. **Mesosemia hesperina.** (Tab. XXXVIII. figg. 13 ♂, 14 ♀.)

Mesosemia hesperina, Butl. Trans. Ent. Soc. 1874, p. 430¹.

Alis lavandulo-cæruleis, anticis ocello nigro albo pupillato ad cellulæ finem, lineis sex transversis nigris, quatuor (margine externo incluso) externis plus minusve margine externo subparallelibus, duabus internis obsoletis per cellulam transeuntibus; posticis lineis sex nigris transfasciatis; subtus griseo-fuscis, lineis fuscis ut supra transfasciatis, anticis ocello ut supra sed fulvo ciliato et juxta eum irregulariter fusco notatis; posticis ocello parvo ad cellulæ finem.

♀ alis fuscis, obscure fusco frequenter transfasciatis, et prope ocellum anticarum fulvo notatis.

Hab. NICARAGUA, Chontales (*Belt*¹); PANAMA, Bugaba (*Champion, Arcé*).

We have Mr. Butler's type specimen of this species before us, and several other males from Chontales, all collected by the late Mr. Belt. We now trace it to the neighbourhood of Chiriqui, where Mr. Champion also obtained a female.

As Mr. Butler remarks, *M. hesperina* is allied to the Brazilian *M. veneris*, but it has a still closer relative in a species from the west coast of Colombia*; and *M. calypso*, Bates, is also nearly allied.

c. Discal area of secondaries blue, without dark bands.

4. **Mesosemia carissima.** (Tab. XXXVIII. figg. 8 ♂, 9 ♀.)

Mesosemia carissima, Bates, Ent. Monthl. Mag. iii. p. 153¹; Trans. Linn. Soc. Zool. ix. p. 417².

Alis fusco-nigris, anticis ocello nigro, cæruleo-albo pupillato et pallide fusco ciliato ad cellulæ finem; posticis plaga magna discali subrotunda læte cærulea; subtus pallide fuscis, extus aliquot nebulosis, ocello anticarum tripupillato et fulvo ciliato, posticis ocello altero simili, fascia communi ultracellulari angusta.

♀ mari similis, sed major et alis omnino dilutioribus, anticis parte distali saturatiore et linea submarginali pallida bisecta, linea altera obscura transversa ultra cellulam.

Hab. NICARAGUA, Chontales (*Belt, Janson*); PANAMA, Veraguas (*Arcé*¹).

This beautiful species was described by Mr. Bates from specimens sent us by our collector Arcé from the neighbourhood of Veraguas. It has since been found at Chontales by the late Mr. Belt. Curiously enough it is not known in any of the

* *Mesosemia thetys*, sp. n.

M. hesperinæ affinis, sed major, colore cæruleo magis obscuro et paulo viridescentiore, plaga nigra infra ocellum anticarum et fasciis omnibus nigris latioribus distinguenda.

Hab. COLOMBIA, Rio San Juan (*Trötsch*).

Mus. nostr.

We are indebted to Dr. Staudinger for the possession of two males of this species.

intermediate country, and has never, so far as we know, been found in the great collecting grounds of Chiriqui and its vicinity.

d. Wings black, crossed by a broad bright blue band.

5. **Mesosemia gaudiolum.** (Tab. XXXVIII. fig. 5, Tab. XLIII. fig. 1 ♀.)

Mesosemia gaudiolum, Bates, Ent. Monthl. Mag. i. p. 202¹; Journ. Linn. Soc. Zool. ix. p. 417².

Alis nigris anticis, plaga magna subtriangulari a dimidio costæ basali ad angulum analem extendente nitide cærulea; posticis margine externo angulato plaga triangulari submarginali nitide cærulea; subtus fuscis, fascia communi lata transversa lineis fulvis et fuscis marginata et ocellos includente; posticis maculis sordide albidis submarginalibus.

♀ alis fuscis, anticis bitriente basali dilutiore, parte distali linea pallida bisecta, ocello nigro bipupillato et fulvo ciliato ad cellulæ finem, extra et intra eum linea fusca ad marginem internum producta et posticas transeunte; posticarum parte distali nigra et plaga purpurascens-cyaneo notata; subtus mari similis.

Hab. GUATEMALA, Vera Paz (*F. D. G. & O. S.*^{1 2}), Choctun, Polochic valley (*Hague*), San Juan in Vera Paz, Senahu, Chiacam (*Champion*).

We obtained several male specimens of this species during an excursion to the forests of Vera Paz north of Coban in 1862, and since then Mr. Hague has forwarded us others from the Polochic valley and elsewhere. Mr. Champion also found it, and to him we are indebted for the single female we now describe.

M. gaudiolum frequents the dense forests of the hotter districts, and, so far as we know at present, its range is restricted to the department of Vera Paz in Guatemala.

6. **Mesosemia grandis.** (Tab. XXXVIII. figg. 6 ♂, 7 ♀.)

Mesosemia grandis, Druce, Trans. Ent. Soc. 1874, p. 159¹.

M. gaudiolo affinis, sed plagis nitide cæruleis fasciam communem latam formantibus a costæ anticarum medio ad angulum posticarum analem transeunte.

♀ anticis parte distali rufo-brunneo lavata, posticis ad marginem externum haud cæruleis.

Hab. COSTA RICA, Cache (*Rogers*); PANAMA, Chiriqui (*Arce*¹), Volcan de Chiriqui, Bugaba (*Champion*).

Mr. Druce described this species from specimens sent from Chiriqui, and we have since received a large series from Mr. Champion, including examples of both sexes. Its presence has also been traced to Costa Rica, whence Mr. Rogers sent us a single female.

M. grandis frequents the denser forests up to an elevation of about 4000 feet on the Volcano of Chiriqui.

e. Base of primaries and discal area of secondaries pale shining blue; female similar to male.

7. **Mesosemia cælestis**, sp. n. (Tab. XXXVIII. fig. 16 ♀.)

Alis cælestino-cæruleis, anticis parte distali nigra ocello nigro ad cellulæ finem et ultra eam linea acuta transversa nigra, marginem internum haud attingente; posticis nigro marginatis; subtus alis fuscis, anticis ocello

sicut supra sed cæruleo pupillato et fulvo ciliato, infra eum maculis irregularibus obscure fuscis, plaga submarginali fusca medialiter rufa, lineisque aliis transversis ad basin, posticis lineis novem obscure fuscis transverse notatis.

♀ mari similis, sed alis dilutioribus posticis lineis tribus transversim fuscis fere obsoletis notatis; subtus plaga magna ad medium marginis externi fulva.

Hab. COSTA RICA, Cache (*Rogers*).—COLOMBIA.

We have long had in our collection two damaged female specimens of this species which were sent us by Mr. Rogers from Costa Rica. The same insect has since been found by Dr. Staudinger's collector, Herr Trötsch, at San Pablo, on the Rio San Juan in Western Colombia, and to Dr. Staudinger we are indebted for a male and two female examples. The latter have the transverse lines on the secondaries above rather more distinct than is the case in our Costa-Rica types, and the tawny rufous patch near the outer margin of the primaries beneath is not quite so distinct, but in spite of these slight differences we have no doubt they all belong to one species.

f. Base of primaries and discal area of secondaries very dark blue; female without blue, but with white subapical band.

8. *Mesosemia asa*. (Tab. XXXVIII. figg. 10 ♂, 11 ♀).

Mesosemia asa, Hew. Trans. Ent. Soc. 1869, p. 35¹.

Mesosemia frequens, Butl. & Druce, Cist. Ent. i. p. 104²; P. Z. S. 1874, p. 352³.

Alis nigris, anticis ad basin chalybeo-cæruleis, oculo nigro albo pupillato ad cellulæ finem, fasciola nigra trans-cellulari intra eum; posticis chalybeo-cæruleis nigro marginatis; subtus saturate fuscis extus aliquot nebulosis, fascia lata communi transversa lineis obscuris et pallidis marginata, ocellos includente; posticis paulo productis.

♀ alis fuscis, triente apicali obscuriore, oculo sicut in mare sed fulvo ciliato, fascia transversa apicem versus alba; posticis lineis quatuor (marginem includente) transversis obscure fuscis; subtus omnino dilutioribus, posticis aliquot irroratis.

Hab. NICARAGUA¹, Chontales (*Belt*); COSTA RICA (*Van Patten*^{2 3}), Cache (*Rogers*); PANAMA, Volcan de Chiriqui, Bugaba (*Champion*).—COLOMBIA.

This *Mesosemia* appears to be very common from Nicaragua southwards to Colombia, and we have many examples from various points included in that area. Hewitson was the first to describe the male from Belt's Chontales specimens; subsequently Messrs. Butler and Druce characterized the female from Costa-Rica examples contained in Van Patten's collection. No doubt *M. asa* and *M. frequens* are the sexes of one species. Hewitson compares it with *M. telegone*; but the resemblance is not very apparent.

Mr. Champion, who took many specimens in the district of Chiriqui, found it in humid dense forest. They frequently bask for a few moments on the upper side of a leaf on which a gleam of sunlight rests.

g. Wings black, a narrow transverse band on primaries and outer margin of secondaries very dark blue.

9. **Mesosemia cecropia.** (Tab. XXXVIII. fig. 12.)

Mesosemia cecropia, Druce, Ent. Monthl. Mag. xi. p. 37¹.

Alis cæruleo-nigris ad basin cæruleis, anticis fascia arcuata transversa ultra cellulam (ad costam latiore) cærulea, fascia altera ejusdem coloris submarginali ad apicem obsoleta, ocello nigro, albo tripupillato ad cellulæ finem vix obvio; posticis cæruleo marginatis; subtus fuscis, anticis ocello ut supra sed fulvo ciliato et lineis alteris duabus irregulariter circummeincto, linea transversa lata submarginali et margine ipso obscure brunneis; posticis brunneo frequenter transfasciatis, ocello bipupillato ad cellulæ finem.

♀ alis pallido fuscis, ocellis ut in mare sed in anticis supra magis obviis, et lineis duabus irregulariter circumcinctis, margine externo late brunneo medialiter vix pallidiore; posticis, lineis septem transfasciatis, duabus exterioribus latoribus et margine externo subparallelibus; subtus mari similis, sed alis omnino pallidioribus; posticis ad medium marginis externi paulo productis.

Hab. COSTA RICA¹ (*Van Patten*).

Of this pretty species the only specimens we have are those which formed part of Van Patten's collection, and the types of Mr. Druce's description. The female is from the same source. *M. cecropia* has no very close allies.

h. Wings brown, with a common broad white curved band.

10. **Mesosemia zonalis**, sp. n. (Tab. XXXVIII. fig. 15 ♀, Tab. XLIII. fig. 2 ♂.)

Alis fuscis, fascia communi lata arcuata, a costa anticarum ad angulum posticarum analem cretaceo-alba, anticarum margine externo late, posticarum anguste, fusco; anticis ocello nigro pupillato et fulvo ciliato ad cellulæ finem, lineis ovalibus extra eum alterne fuscis et albidis ad costam fractis, extima marginem internum attingente; posticis dimidio basali (basi ipsa excepta) lineis obscure fuscis transfasciatis, fascia alba ad angulum analem lincis obsoletis fuscis longitudinaliter notata; subtus fere omnino ut supra sed colore fusco dilutiore et fascia alba posticarum linea fusca bisecta, margine quoque latiore fusco.

♀ mari persimilis, sed fascia alba communi in posticis bifurcata.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*), Cache (*Rogers*); PANAMA, Bugaba (*Champion*), Calobre (*Arcé*), Lion Hill (*M. Leannan*).—COLOMBIA.

M. machara, from the Amazons, seems to be the species most nearly allied to this; but in that species the sexual difference in coloration is greater, the base of the wings being altogether darker.

M. zonalis is evidently a common species in the neighbourhood of Chiriqui, and thence we trace it northwards to Chontales, where Belt captured several examples, and southwards to Western Colombia, whence we have a single specimen obtained by Dr. Staudinger's collector, Herr Trötsch, at San Pablo, on the Rio San Juan.

Mr. Champion took his examples in dense forest.

i. Wings cretaceous white, crossed by narrow dusky bands.

11. **Mesosemia vestalis.** (Tab. XXXVIII. fig. 17 ♀.)

Mesosemia vestalis, Bates, Ent. Monthl. Mag. i. p. 203¹.

♀ alis cretaceo-albis punctis submarginalibus nigris ornatis, anticis ocello elongato parvo ad cellulæ finem;

fasciis duabus, margine externo subparallelibus (ad marginem posticarum internum productis) et margine ipso fuscis, fascia altera transcellulari; subtus lineis omnibus multo latioribus, anticis ad basin posticis medialiter fusco irroratis.

Hab. GUATEMALA, forests of Northern Vera Paz (*F. D. G. & O. S.*¹), Cubilguitz, Panima, Purula, Sinanja, Sabo (*Champion*).

The first specimen we took of this species is a female, and all that have since come to us are of that sex; but there is little difference in coloration between the sexes in this section of *Mesosemia*.

The distinguishing characters of *M. vestalis* are the submarginal row of black spots on both wings, and the rather elongated ocellus on the primaries. There is no submarginal ocellus on the primaries nor on the secondaries above or below; *M. lagora* has both, *M. lepida* the former and a cellular ocellus beneath, and *M. nivalis* no cellular ocellus above or below.

With the exception of *M. leucogæa* described below, *M. vestalis* seems most nearly allied to *M. philemon* of the Amazons region; but that species has a line instead of the submarginal row of black spots.

It is an inhabitant of dense forest up to an elevation of about 4000 feet.

12. *Mesosemia leucogæa*, sp. n.

M. vestali similis, sed minor, et anticarum lineis fuscis latioribus punctis submarginalibus vix apparentibus, anticarum ocello majore, rotundo et albo bipupillato, posticis lineis transversis tribus (nec duabus) fuscis, diversa.

Hab. NICARAGUA, Chontales (*Belt*).

We have two female specimens of this species, which, though closely allied to *M. vestalis*, seems sufficiently distinct. The size of the ocellus of the primaries recalls the South-American *M. hyphæa* and *M. matisca*.

13. *Mesosemia lagora*.

Diophthalma lagora, Herr.-Schäff. Samml. aussereur. Schmett. p. 55, f. 43, 44¹.

M. vestali similis, sed anticis ad marginem externum fuscis, ocello submarginali, altero parvo ad medium marginis posticarum externi, subtus ocello cellulari nullo.

♀ mari similis.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Volcan de Chiriqui (*Champion*).—GUIANA¹.

We have little doubt this species is rightly named *M. lagora*, Herr.-Sch., concerning which much confusion has arisen, chiefly owing to Hewitson having mistaken the insect and figured another species under this name.

The characteristics of *M. lagora* are the presence of submarginal ocelli in both wings above and below, and the absence of any ocellus in the cell of the primaries.

Found in dense humid forest (*Champion*).

BIOL. CENTR.-AMER., Rhopal., Vol. I., December 1885.

14. *Mesosemia lepida*, sp. n. (Tab. XLIII. fig. 3.)

M. lagoræ proxima, sed posticis ocello submarginali haud notatis forsan distinguenda.

Hab. PANAMA, Bugaba (*Champion*).

It is perhaps doubtful if this insect will ultimately prove distinct from *M. lagora*. We have six specimens of it, none of which have any indication of an ocellus or black spot near the middle of the outer margin of the secondaries on the upper side.

15. *Mesosemia molina*, sp. n.

Mesosemia lagora, Hew. Ex. Butt., *Mesosemia*, t. 3. f. 20 (nec Herr.-Sch.)¹; Butl. & Druce, P. Z. S. 1875, p. 352².

M. lagoræ quoad paginam superiorem proxima, sed subtus anticis ocello cellulari facile distinguenda.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*²), Irazu (*Rogers*); PANAMA, Lion Hill (*M^cLeannan*).—COLOMBIA¹; ECUADOR; GUIANA.

This species, which Hewitson figured as *M. lagora* from Colombian examples, is easily to be distinguished from that insect by the presence of a very distinct ocellus on the primaries beneath, which, in some examples, shows through to the upper side, as indicated in Hewitson's plate.

It is perhaps one of the commonest forms of this section of *Mesosemia* as far north as Nicaragua.

16. *Mesosemia nivalis*, sp. n. (Tab. XLIII. fig. 4.)

M. lagoræ quoque similis, sed alis candidissimis lineis fuscis angustissimis, anticarum margine externo haud fusco, et ocellis in pagina superiore nullis distinguenda.

Hab. MEXICO, Jalapa (*H. Edwards*); GUATEMALA, Polochic valley (*Hague*), Panima, Zapote, Pantaleon, Las Mercedes, San Isidro (*Champion*); NICARAGUA, Chontales (*Belt*).

This is much the whitest of these *Mesosemiæ* in our region, being even whiter than *M. vestalis*.

The submarginal ocelli of *M. lagora* are just indicated by black spots on the under-side; but on the upper side they are not visible. There is no ocellus in the cell of the primaries, and in this respect *M. nivalis* differs from *M. vestalis* and *M. molina*.

At San Isidro it is found in the cacao-plantations (*Champion*).

Two other species allied to *M. nivalis* are represented in our collection by a good series of specimens. They are described below*.

* *Mesosemia nivea*, sp. n.

M. nivali similis quoad paginam superiorem sed lineis fuscis aliquot latioribus; subtus alis macula ad cellulae finem nigra, et posticis punctis submarginalibus nigris distinguenda.

Hab. BOLIVIA (*Buckley*); BRAZIL, Minas Geraes, Espirito Santo.

Mus. nostr.

[See opp.

CREMNA.

Cremna, Westwood, Gen. Diurn. Lep. p. 456 (1851).

There are nine species of this genus known to us, two of which occur in our country; the range extending from Guatemala throughout tropical America to South Brazil.

Like *Mesosemia* the subcostal nervure of the primaries has four branches; the wings, too, are truncate as in that genus, and though it seems well placed here its style of coloration and markings readily distinguish its members. The subcostal nervure of *C. eucharila* emits two branches before and two after the cell; the middle discocellular and the upper radial leave the subcostal at the same point; the former, as well as the lower discocellular, are atrophied as they approach the lower radial; the costal and median sides of the cells are subequal. The secondaries have a strong basal nervure; the upper discocellular is perfect, and meets the subcostal a little beyond the first branch; the lower discocellular is bent in the middle, the upper half being atrophied; the costal side of the cell is shorter than the median side. The front legs of the male have the coxa pointed, the trochanter being inserted about the middle; the femur = $\frac{1}{2}$ coxa; tibia < coxa; tarsus (single-jointed) < tibia, with a single spine at the end. The terminal tarsal joint of the female = second + third joints, and has a setose pad beneath. The first joint ends with a single spine, the second, third, and fourth with two. The terminal joint of the palpi is slender, about one fifth of middle joint, which is of nearly equal width throughout; the basal joint is slightly > the terminal joint. The antennæ have thirty-five joints (*C. umbra* thirty-two) and terminate in a well-defined club. The eyes are smooth.

The secondary male organs have the tegumen as in *Mesosemia*; the harpagones terminate in a strong slightly upturned spine; the penis has a short strap in the usual position: the penis of *C. umbra* has a filament exerted from its extremity; we do not see this character in *C. eucharila*. The bursa copulatrix of the females of both these species have two conical chitinous points with finely granulated surfaces.

1. *Cremna eucharila*. (Tab. XXXVIII. figg. 18 ♂, 19 ♀.)

Napæa frequens actoris, Hübn. Samml. ex. Schmett. i. t. 34¹ (nec Cramer).

Cremna eucharila, Bates, Journ. Linn. Soc. Zool. ix. p. 420².

Alis fuscis sordide albo maculatis, posticis plerumque saturatioribus (interdum fere immaculatis), fascia submarginali ferruginea interdum lata interdum fere obsoleta; subtus maculis omnibus majoribus in posticis lineatis fascias transversas fere formantibus, venis quoque pallidis, anticis maculis singulis discalibus intus plaga magna nigricante conjunctis.

♀ major et alis dilutioribus maculis omnibus majoribus.

Mesosemia chionea, sp. n.

Speciei precedenti affinis et maculis cellularibus subtus eodem modo ornatis, anticis lineis fuscis pagina superioris latioribus, subtus linea altera submarginali alba notatis.

Hab. GUIANA, Roraima (*Whitely*), Cayenne (*Bar*).

Mus. nostr.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA, San Francisco (*Rogers*); PANAMA, Chiriqui (*Ribbe, Zahn*), Bugaba, David (*Champion*), Calobre (*Arcé*), Lion Hill (*McLeannan*).—COLOMBIA; VENEZUELA; AMAZONS²; GUIANA; BRAZIL².

We are unable to treat this species otherwise than as a very variable one, especially as regards the coloration of the male specimens from the northern extremity of its range. This variation is chiefly shown in the colour of the secondaries, which in some individuals are almost unspotted black with a broad ferruginous band; in others this band disappears and the wings are more or less spotted.

Its nearest ally is *C. actoris* (Cramer), under which name it was figured by Hübner¹. Mr. Bates separated it in his catalogue of Erycinidæ. *C. actoris* seems to differ chiefly in the total absence of the rusty band of the secondaries, but the two insects are very closely allied.

In Central America *C. eucharila* is not uncommon as far north as Nicaragua, and both Belt's collection and that of Mr. Champion from Chiriqui contained a fair series of specimens. The largest and most aberrant specimens in our collection are from Costa Rica and are those figured on our Plate.

2. *Cremna umbra*.

Hypophylla umbra, Boisd. Lép. Guat. p. 23¹.

Cremna crebrenia, Hew. Ex. Butt., Paethyhone and Cremna, t. 1. f. 1-3² (Jan. 1, 1873).

Alis fuscis, lineis fusco-nigris valde irregularibus transvittatis, anticis puncto subapicali albo; subtus alis pallidioribus maculis nigricantibus magis obviis.

♀ mari omnino similis.

Hab. GUATEMALA, Zapote, San Isidro, El Tumbador, Chiacam, Cahabon (*Champion*), Polochic valley, San Gerónimo (*Hague*); HONDURAS^{1 2}; COSTA RICA, Cache (*Rogers*).

This species has a close ally in *C. phryxe*, Felder, from Brazil, but may be distinguished by the paler under surface of the wings, the spots being more prominent and less linear.

Both Boisduval's and Hewitson's types were from Honduras; we have compared that of the former, thanks to Mons. C. Oberthür's kindness, with our series, and find them agree^{1 2}. In Guatemala it is not uncommon in the hotter districts on both sides of the cordillera up to an elevation of about 3000 feet. We have not yet traced it southwards of Costa Rica.

B. Subcostal nervure of primaries with three branches.

- a.* Subcostal nervure of the primaries with all its branches emitted beyond the end of the cell.

ZEONIA.

Zeonia, Swainson, Zool. Ill. Ins. ser. 2, iii. t. 111 (1833); Westwood, Gen. Diurn. Lep. p. 431 (1851).

Zeonia contains about eight species spreading from Nicaragua to South Brazil; only one occurs within our borders and this is also found in Colombia.

The wings being for the most part hyaline render it a conspicuous genus, which is usually associated with *Erycina*, but from which it differs in several important particulars; the neuration of the secondaries as well as their shape suggests a relationship with *Diorhina*, the prolonged palpi of which latter genus readily distinguish it.

The subcostal nervure of the primaries of *Z. corineus* emits its three branches beyond the cell; the first branch sometimes forms an anchylosis with the costal nervure; the middle discocellular is perfect and meets the subcostal at an acute angle; the lower discocellular is curved, atrophied in the middle, and meets the median beyond the second branch; the costal side of the cell is longer than the median side. The secondaries have a very long basal nervure; both discocellulars are atrophied, the upper meets the subcostal beyond the first branch, the lower joins the median beyond the second branch; the two branches of the median start close together and diverge very gradually from the median, the first branch is prolonged and carries a tail-like appendage; the costal side of the cell is much shorter than the median side. The front legs of the male have the trochanter inserted before the middle of the coxa; femur $> \frac{1}{2}$ coxa; tibia $<$ coxa, dilated in the middle; tarsus = femur + trochanter, there are two constrictions indicating the tarsal joints. The terminal joint of the palpi is very small, $< \frac{1}{4}$ middle joint, which tapers towards its distal end; basal joint stout = $\frac{1}{2}$ middle joint; antennæ forty-three joints, the terminal seventeen forming a moderate club.

The harpagones in the male secondary sexual organs are slightly setose; between them in the middle line is a long slightly upturned setose spine; a piece apparently arches over the penis between the upper lobes of the harpagones. The penis tapers very gradually to the end and is slightly decurved; the strap connecting its base with that of the harpagones is directed outwards and then bent back again.

1. *Zeonia bogota*.

Zeonia bogota, Saund. Trans. Ent. Soc. ser. 2, v. p. 98¹; Bates, Journ. Linn. Soc. Zool. ix. p. 430².

Alis hyalinis venis nigris divisis, anticis costa, margine externo et fascia per cellulæ finem obliqua nigris; posticis margine externo dimidio distali, margine interno late et fascia submarginali nigris, plaga magna ad angulum analem coccinea; subtus ut supra sed partibus nigris certa luce cæruleo lavatis, posticis macula alba in angulo inter venas costalem et subcostalem, striaque ad marginem internum ejusdem coloris
♀ mari similis, colore cæruleo paginæ alarum inferioris absente.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Bugaba (*Champion*).—COLOMBIA¹

Central-American examples agree best with those from Colombia, which we have little doubt are referable to *Z. bogota* of Saunders. This form is closely allied to *Z. amazona* of the Amazons valley, the chief, if not the only, differences being the absence in that species of the blue gloss on the wings beneath, and in the scarlet patch being rather larger and more narrowly edged with black between the ends of the submedian nervure and the first median branch.

Z. bogota seems to be rare in Central America, and our series includes but few examples; with them is a single damaged male from Belt's Chontales collection.

Frequents sunny openings in the forest (*Champion*).

b. Subcostal nervure of the primaries with one branch emitted before and two after the end of the cell.

a'. Middle discocellular of primaries perfect*.

DIORHINA.

Diorina, Morisse, Ann. Soc. Ent. France, vi. p. 422 (1837).

We recognize four species of this genus, its range extending from South Mexico to South Brazil; all but one of these are also found in our country, only one of them, however, *D. butes*, is at all common.

Diorhina is very closely allied to *Erycina*, the neuration of the wings offering, so far as we can see, no material difference, except that one branch is emitted from the subcostal of the primaries instead of none; the palpi projecting in front of the head are very apparent when viewed from above, and the absence of metallic colouring from the wings of both sexes serve as distinguishing characters; there are differences in the secondary sexual organs. The harpagones have a single lobe which bends upwards rather abruptly at its extremity, near which are some strong spines directed upwards and mingled with them some long hairs; an arch extends over the penis bearing two lobes directed upwards and slightly expanded towards the extremity and edged with short strong spines directed slightly outwards; the penis itself is not nearly so dilated towards the base as in *Erycina*; the strap connecting it with the base of the harpagones is directed forward before being bent backwards again. In *D. butes* both the lobes of the harpagones and those of the median arch are more pointed and bear strong spines towards their ends. The bursa copulatrix of *D. periander* is without chitinous spines.

1. *Diorhina periander*.

Papilio periander, Cram. Pap. Ex. t. 188. f. C¹.

Diorhina periander, Bates, Journ. Linn. Soc. Zool. ix. p. 429².

Ancyluris iphinoe, Hübn. Samml. ex. Schm. iii. t.³

Alis fusco-nigris, anticis ad basin et posticis fere omnino late caeruleo-fulvis; anticis fascia transversa distincta ultracellulari fusco-albida; posticis maculis duabus puniceis, una ad medium marginis interni, altera ad angulum analem: subtus fuscis bifasciatis, fascia interiori latiore, anticis ad basin costae coccineis, posticis ad angulum analem maculis tribus (intordum confluentibus) puniceis; palpis extus albidis, cruribus anticis fuscis.

♀ major, alis omnino fuscis albido bifasciatis, aliter mari similis.

Hab. BRITISH HONDURAS (*Blancaneaux*); GUATEMALA, forests of Northern Vera Paz (*F. D. G. & O. S.*); NICARAGUA, Chontales (*Belt*); PANAMA, Lion Hill (*M^cLeannan*).—SOUTH AMERICA, Colombia to Peru, Amazons valley and Guiana¹.

* The extralimital genera *Orestia* and *Threnodes* (?) come into this division.

A very abundant widely ranging species over the northern parts of South America, and in our country found as far north as British Honduras and Guatemala, but in the latter countries, as indeed throughout Central America, it is by no means so common.

The name *D. periander* was founded by Cramer upon a female specimen which we have no difficulty in recognizing. Central-American males have an incipient median white band on the secondaries; this can also be traced to a less extent in southern examples. It is not a character of specific value.

The alliances of *D. periander* are with *D. psecas* and *D. dysoni*, but it has many points of distinction; with the former it is compared below.

2. *Diorhina psecas*.

Erycina psecas, Saund. Trans. Ent. Soc. v. p. 219, t. 20. f. 4, 4a¹.

Diorhina psecas, Bates, Journ. Linn. Soc. Zool. ix. p. 429².

D. periandro similis, sed alis cærulescentioribus et albedo distincte bifasciatis, posticis fascia arcuata transversa punicea ad angulum analem; subtus nigricantioribus fasciis, pure albis, anticarum costa multo minus coccinea, posticis macula ut supra pure coccinea distinguenda.

♀ alis fusciscentibus vitta obliqua ab angulo posticarum anali extendente et macula supra eam coccineis; subtus fere omnino ut supra.

Hab. PANAMA, Volcan de Chiriqui (*Champion*).—SOUTH AMERICA, Colombia to Bolivia¹ and to Guiana.

Mr. Champion captured two male specimens undoubtedly belonging to this species on the slopes of the Volcan de Chiriqui. These are the only Central-American examples of it we have seen. In South America it has a wide range, the original types having come from Peru¹.

3. *Diorhina butes*.

Papilio butes, Linn. Syst. Nat. i. p. 794¹; Clerck, Icon. Ins. t. 46. f. 6².

Diorhina butes, Bates, Journ. Linn. Soc. Zool. ix. p. 429³.

Papilio licarsis, Fabr. Gen. Ins. p. 271⁴.

Erycina licarsis, Morisse, Ann. Ent. Soc. Fr. 1837, p. 419, t. 14. f. 1, 2⁵; Butl. Ent. Monthl. Mag. iii. p. 53⁶.

Papilio rhetus, Cram. Pap. Ex. t. 63. f. C⁷.

Rhetus crameri, Sw. Zool. Ill. ser. 2, i. t. 33⁸.

Diorhina thia, Morisse, Ann. Ent. Soc. Fr. 1837, p. 419, t. 14. f. 3, 4⁹; Bates, Journ. Linn. Soc. Zool. ix. p. 430¹⁰.

Alis fusco-nigris, albo bifasciatis; anticis ad costæ basin coccineis, posticis parte distali nitide cæruleis valde productis, ad angulum analem coccineis et ultra vitta transversa albida; subtus ut supra, colore cæruleo absente; thorace cæruleo, abdomine utrinque coccineo lineato.

♀ mari similis, sed alis supra colore cæruleo absente, posticis magis productis.

Obs. A *D. psecas* statura minore et posticis valde productis differt.

Hab. MEXICO⁷, Cordova (*Rümeli*), Oaxaca (*Fenochio*), Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Cubilguitz (*Champion*), San Gerónimo, Polochic valley (*F. D. G. & O. S.*); PANAMA, David (*Champion*).—SOUTH AMERICA, Colombia to South Brazil⁸.

As will be seen above this species has a continuous range from Mexico in the north to South-eastern Brazil, and in our series of twenty-six specimens it is represented from nearly every point. Some variation in specimens from so wide an area was to be expected, but on the whole there is little individual variation, still less any that can be fixed to a definite locality. Mexican and Brazilian specimens are inseparable, and it is only in the Amazons region, and perhaps Guiana, that a slight thickening of the outer band of the primaries can sometimes be traced. With the evidence of the specimens before us, together with the published descriptions and figures, we are driven to the conclusion that there is but one species of this form which should bear the Linnæan name *D. butes*.

Mr. Butler has endeavoured to show that at least two South-American species exist of this form; but when he argues that Swainson figures both of them on the same plate, the subjects of which, we infer from the text, that traveller captured flying around the same shrub, we feel justified in doubting the value of Mr. Butler's differential characters.

Regarding *D. thia* of Morisse, which has usually been kept separate from *D. butes*, we are of the opinion that the Mexican form has nothing to distinguish it with certainty from the insect of Colombia or Brazil.

D. butes flies usually in open scrubby brushwood, such as is found at San Gerónimo and other places in Central Guatemala, lying at an elevation of about 3000 feet above the sea.

ERYCINA.

Erycina, Fabricius, Ill. Mag. vi. p. 286 (1807); Westwood, Gen. Diurn. Lep. p. 428.

This genus includes about twenty-two species, ranging from Mexico to the valley of the Amazons, Bolivia, and Guiana. Two only are certainly found within our limits, which have the same range from Mexico to Panama; one of them, *E. inca*, just passes our southern border into Colombia, the other is represented in that country by a very closely allied species. A third species, *C. cacica* of Colombia, is stated by Boisduval to be found in Nicaragua.

The subcostal nervure in the primaries of *E. inca* emits one branch before the end of the cell and two after it; the upper discocellular is perfect but short, meeting the subcostal at a slightly acute angle; the lower discocellular is atrophied in the middle and meets the median a little beyond the second branch; the upper radial meets the subcostal a little beyond the cell; the costal side of the cell is slightly longer than the median side. The secondaries have a strong basal nervure; the discocellulars run nearly in a line from the subcostal nervure beyond the first branch to the median a little beyond the second; both are atrophied for the greater part of their length; the costal side of the cell is much shorter than the median side.

The front legs of the male have the trochanter inserted about the middle of the coxa;

femur = $\frac{1}{2}$ coxa, tibia = coxa, tarsus (single-jointed) = $\frac{2}{3}$ tibia. The terminal tarsal joint of the front leg of the female is longer than either of the three preceding joints, and has a setose pad beneath; the first four joints terminate beneath with a pair of strong spines.

The terminal joint of the palpi is short = $\frac{1}{4}$ middle joint, it is dilated towards its base but tapers towards its distal end; the basal joint is short, slightly longer than the terminal joint. Antennæ have fifty-two joints, of which the terminal eighteen form a moderate club.

The secondary male organs have the tegumen normal; the harpagones are bilobed, slightly setose externally; a strap proceeds from near the end of the penis, is directed outwards between the harpagones, and is then bent abruptly backwards to their base. The penis itself is swollen towards the base, slightly decurved and pointed towards the extremity, whence apparently proceed several filaments furnished with chitinous papillæ. The bursa copulatrix of the female has a pair of chitinous spines, smooth, and of the shape of mammæ.

1. *Erycina jurgenseni*.

Erycina jurgenseni, Saund. Trans. Ent. Soc. v. p. 220, t. 20. f. 3¹.

Erycina montezuma, Saund. loc. cit. p. 226, t. 21. f. 5, 5a²; Bates, Journ. Linn. Soc. Zool. ix. p. 429³.

Erycina erigone, Boisd. Léop. Guat. p. 20⁴.

Alis nigrificato-fuscis, fascia communi mediana punicea in posticis ad marginem internum refracta et ultra eam macula ejusdem coloris; posticis fascia maculosa angusta viridescente micante (in anticas interdum producta), angulo ipso lætissime cæruleo; subtus nitidissime cæruleo-viridescentibus marginibus et fascia communi lata mediana nigerimis, macula ad medium posticarum marginis interni coccinea, macula altera infra eam et ciliis inter venas albis; cruribus anticis nitide cæruleo-viridoscentibus fusco ciliatis.

♀ multo major, alis fuscis albo bifasciatis, fascia interna latiore et utraque coccineo terminata; posticis macula ejusdem coloris ad angulum analem, utraque maculis albis, lutra cas cæruleo micantibus; subtus fere ut supra, fascia externa alba magis distincta.

Hab. MEXICO (*Jurgensen* ^{1 2 4}); GUATEMALA, Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*); PANAMA, Bugaba (*Champion*).

The late Mr. Wilson Saunders described the female of this species as *E. jurgenseni*, and in the same paper the male as *E. montezuma*, at the same time suggesting that they were sexes of one species, a surmise we believe to have been fully justified. We have no specimens from Mexico whence the types were derived, but we recognize the species in our examples from the rest of Central America, and note the distinction between them and Colombian specimens, the true *E. atahualpa* of Saunders. These differences are very slight, but, so far as we can see, constant. There is a red spot at the anal angle of the secondaries not seen in *E. atahualpa*; the blue submarginal spots of the secondaries are smaller.

E. jurgenseni is nowhere common; a specimen or two from each of the above localities are all we have seen.

2. *Erycina inca*.

Erycina inca, Saund. Trans. Ent. Soc. v. p. 227, t. 21. f. 6, 6 *a*¹; Bates, Journ. Linn. Soc. Zool. ix. p. 429²; Boisd. Léop. Guat. p. 18³.

Erycina ocollo, Saund. Trans. Ent. Soc. ser. 2, v. p. 105, t. 10. f. 6, 7¹; Bates, Journ. Linn. Soc. Zool. ix. p. 429⁵?

Alis nigris, anticis fascia mediana transversa aurantia, posticis ad angulum analem cæruleo micantibus et maculis transversis albis indistincte notatis, ciliis inter venas albis; subtus viridi-cæruleo micantibus venis divis, fascia communi lata velutino-nigra ad marginem posticarum internum refracta; anticis macula infra-cellulari alba, altera ad angulum analem aurantia; posticis macula ad medium marginis interni aurantia, altera ad angulum analem alba; cruribus anticis cæruleo micantibus fusco ciliatis; abdomine utrinque aurantio lineata.

♀ mari similis, fascia anticarum latiore; posticis plaga magna discali viridi-cærulea, altera ad medium costæ aurantia; subtus omnino differt, alis nigris ambabus aurantio bisectis, anticis ad apicem albo trimaculatis; posticis maculis in serie submarginali positis albis.

Hab. MEXICO (*Jurgensen*¹); GUATEMALA, forests of northern Vera Paz, Polochic valley (*F. D. G. & O. S.*), Panima (*Champion*); NICARAGUA, Chontales (*Belt*); PANAMA, Bugaba, Tolé, San Feliz (*Champion*), Calobre (*Arce*), Lion Hill (*McLeannan*).—COLOMBIA^{4 5}?

Erycina inca is the commonest species of *Erycina* in Central America, being found in abundance in all the heavily forested country from Mexico to Colombia. In Guatemala, however, it seems restricted to the eastern side of the country, and it is only when we reach Chiriqui that we find it near the shores of the Pacific Ocean.

Of the Colombia insect, the female of which was described by Saunders as *E. ocollo*, we have only a single example. We suspect that the male has been described by Boisduval as *Erycina lais*, which is said to differ from *E. inca* in having the caudal projections of the secondaries devoid of blue. If this is a stable character the insect should bear the name *E. ocollo*; but we have no materials to prove this point. The figures of *E. ocollo* represent accurately females of the Central-American *E. inca*.

This species possesses the same habit as others of the genus and also of *Diorhina* in settling beneath leaves, the wings spread out horizontally; if disturbed it invariably seeks to hide itself beneath another leaf (*Champion*).

3. *Erycina cacica*.

Erycina cacica, Feld. Reise d. Nov. Lep. p. 290¹.

Erycina zinna, Boisd. Léop. Guat. p. 19².

Alis supra nigricantibus, anticis fascia transversa lata fere a costæ medio ad marginem internum angulum analem versus, intus recta extus leviter arcuata, coccinea, certa luce opalescente, macula minuta subcostali supra eam ejusdem coloris; posticis linea a costâ ad ramum medianum ultra cellulam coccinea utrinque cyaneo marginata, plaga magna tripartita ad angulum analem nitente cyanea, maculata obsoleta ad marginem internum coccinea, altera infra subcostali; subtus saturatioribus, anticis striga subcostali, plagula discali et dimidio alarum distali nitide virescenti-cyaneis, venis nigris divis, macula ad angulum analem coccinea; posticis margine interno fascia discali abbreviata et altera submarginali virescenti-cyaneis, venis nigris divis, maculis marginis interni ut supra sed multo magis obviis. Femina ignota.

Hab. NICARAGUA (fide *Boisduval*²).—COLOMBIA¹.

We include this species in this work on the authority of Boisduval, one of whose types of *E. zinna* is stated to have been obtained in Nicaragua, but we have no confirmation of its occurrence in Central America. M. Oberthür has kindly lent us one of the types for examination and we have no difficulty in recognizing it as a species described by Dr. Felder as *E. cacica* of Colombia. It is allied to *E. huascar*, obvious differences being the greater width of the scarlet band of the primaries and the opalescent tint pervading it. *E. formosa* is also allied to it, but the scarlet band on the secondaries is wanting in this species.

LYROPTERYX.

Lyropteryx, Westwood, Gen. Diurn. Lep. p. 433 (1851).

Five species are included in this genus, spread from Guatemala on the north to southern Brazil in South America; one species occurs within our limits, which has close allies in Colombia, the Amazons valley, and Brazil.

The subcostal nervure of the primaries in the male of *L. cleadas* emits one branch before the end of the cell and two after it; the upper discocellular is not atrophied, it makes an acute angle with the subcostal, which it meets nearer the base than the upper radial; the lower discocellular is curved and atrophied in the middle, it joins the median beyond the second branch; the costal side of the cell is longer than the median side. The secondaries have a strong basal nervure; the upper discocellular is not atrophied and meets the subcostal beyond the first branch at an obtuse angle; the lower discocellular is atrophied in the middle, it meets the median beyond the second branch; the costal side of the cell is much shorter than the median side. In the front legs of the male the trochanter is inserted before the middle of the coxa; the femur = $\frac{1}{2}$ coxa, dilated towards its distal end; tibia = coxa, dilated towards the middle; tarsus (single-jointed) = femur. Palpi have the terminal joint very small = $\frac{1}{8}$ middle joint, which tapers gradually towards the distal end; basal joint dilated, short = $\frac{1}{3}$ middle joint. Antennæ have fifty-five joints, the terminal twenty-four forming a very gradual club.

The tegumen in the secondary organs of the male is normal; the harpagones are long rods bent in the middle and then extending upwards almost to the tegumen; there are patches of strong spines inside the angle, and at the extremity there is a cluster of spines. Over the penis there is an arch produced outwards in a point in the middle line; at its base on either side is a lobe directed outwards, at the extremity of which is a cluster of strong spines.

1. *Lyropteryx cleadas*. (Tab. XII. figg. 9, 10 ♂, 11, 12 ♀.)

Lyropteryx cleadas, Druce, Cist. Ent. i. p. 359¹.

Alis cyaneo-nigris, anticis ad basin et ad costam viridi-cæruleo notatis, fascia communi in anticis subapicali in posticis submarginali nitenti-viridescente, venis nigris divisa et inter venas albida; posticis macula ad

basin costæ coccinea; subtus fuscis undique a cellulis ad margines albo radiolatis, anticis ad basin maculis quatuor, posticis octo, pure coccineis nigro marginatis, notatis; cruribus anticis medialiter viridi-cæruleo micantibus.

♀ alis nigris, fascia submarginali communi coccinea venis divisa in anticis apicem fere attingente; subtus fuscis, bitricito distali inter venas albido biradiatis, fascia communi paginæ superioris maculosa, macula singula coccinea rosaceo-albo circumcincta, maculis basalibus sicut in mare.

Hab. GUATEMALA, Polochic valley (*Ilague*¹), Panzos (*Champion*); PANAMA, Bugaba (*Champion*).

This Central-American representative of *Lyropteryx* is found from Guatemala to the State of Panama, its place being taken in Colombia by *L. lyra*, the males almost exactly agreeing on the upper side; but the two species are readily distinguished by the spots at the base of the wings beneath, those of *L. cleadas* being pure scarlet, while those of *L. lyra* have a purple cast, as in *L. apollonia*. *L. olivia*, of Brazil, also has these spots pure scarlet; but the female of that species differs from that sex of *L. cleadas* by the red band of the primaries crossing the wing much further from the apex.

Mr. Druce, when describing *L. cleadas*, states that he had seen a Chiriqui specimen from Dr. Staudinger's collection which agreed with the type of *L. olivia*; but we are confident that he must have made an error in this identification, as our female from Chiriqui agrees in all respects with the type of that sex from Guatemala, and specimens of both sexes of *L. olivia* are in the Berlin Museum from Brazil. The female of *L. lyra* is, we believe, as yet unknown.

Mr. Champion's Bugaba specimens were captured about the flowers of a small tree in the second-growth woods.

NECYRIA.

Necyria, Westwood, Gen. Diurn. Lep. p. 432 (1851).

There are fourteen species belonging to this genus: three of them are found within our limits, the remainder extending southwards along the Andes, and one reaching into Bolivia. It is a well-marked genus, and is allied to *Lyropteryx*, both as regards the neuration of the wings and the secondary sexual characters in the males.

The subcostal nervure of the primaries of the male in *N. manco* emits one branch before the end of the cell and two after it; the middle discocellular is perfect and meets the subcostal at an acute angle close to the junction of the upper radial; the lower discocellular is atrophied in the middle and meets the median at an acute angle a little beyond the second branch; the costal side of the cell is a little longer than the median side. The secondaries have a strong basal nervure; the upper discocellular is perfect and meets the subcostal a little beyond the first branch at an obtuse angle; the lower discocellular is atrophied towards its upper end and meets the median a little beyond the second branch; the costal side of the cell is much shorter than the median.

The front legs of the male have the trochanter inserted about the middle of the coxa;

the femur $=\frac{2}{3}$ coxa, dilated towards the distal end; tibia $>$ coxa, dilated in the middle; tarsus $<$ femur (single-jointed). The terminal joint of the palpi is short $=\frac{1}{2}$ middle joint; basal joint dilated $=\frac{1}{3}$ middle joint. Antennæ with forty-eight joints, the terminal seventeen forming a moderate club.

The tegumen in the male of the secondary sexual organs is normal; the harpagones are long, slightly tapering rods, blunt at the end, and the inner edge bears long strong setæ; a chitinous piece forms an arch over the penis and is produced outwards into a long stout depressed hook; on either side of the base is a lobe bearing at the end a pencil of strong setæ; a strap extends from the base of the penis outwards and then curves backwards to the base of the harpagones.

1. *Necyria beltiana*.

Necyria beltiana, Hew. Ent. Monthl. Mag. vii. p. 3¹; Ex. Butt., Erycina and Necyria, f. 5, 6².

Alis nigris vix viridi tinctis, anticis fascia arcuata nitente viridissima ultracellulari a costa ad angulum analem extensa, lineolis inter venas omnes albis notata, macula parva ad cellulæ finem micante-viridi; posticis margine externo nitente-viridi venis diviso et inter venas albo lineolato, margine ipso nigro ciliis albis; subtus nigris, anticis ultra cellulam et posticis ad marginem externum splendide viridescentibus, alis ambabus ad basin eodem colore maculatis, fronte et palpis fusco-nigris, eruribus anticis splendide viridescentibus, abdomine utrinque rubro lineato.

♀ supra mari similis, alarum lineolis albis majoribus, subtus colore metallico absente, anticis maculis duabus una cellulari altera inter venas medianas et submedianas coccineis, posticis macula ejusdem coloris supra cellulæ finem.

Hab. NICARAGUA, Chontales (*Belt*^{1 2}).

The only specimens of this species which have come under our notice were obtained by the late Thomas Belt, after whom the species was named by Hewitson¹. *N. beltiana* has no very near allies in Central America; *N. vetulonia*, of Ecuador is perhaps its next akin in the southern continent.

2. *Necyria ingaretha*.

Necyria ingaretha, Hew. Ex. Butt., Necyria and Esthemopsis, f. 8, 9¹.

Alis obscure fuscis, maculis viridibus intus albo hastatis in serie submarginali; posticis subtus ut supra, sed maculis submarginalibus omnino albis et multo magis distinctis; posticis macula triangula coccinea ad medium marginis interni, ciliis albis.

♂ adhuc ignotus.

Hab. NICARAGUA, Chontales (*Belt*).

The only specimen known of this species is that described by Hewitson from Belt's collection. Though found with *N. beltiana* near Chontales, *N. ingaretha* seems quite distinct from that insect, but until we know the male we cannot speak with certainty as to its alliances.

3. *Necyria larunda*, n. sp. (Tab. XLIII. figg. 11, 12.)

Alis chalybeo-cæruleo-nigris, præter basin lineolis elongatis albis inter venas notatis; posticis macula costali, altera ad medium marginis interni, coccineis; subtus ut supra sed posticarum dimidio distali cærulescentiori,

anticis ad medium marginis interni macula coccinea, posticis maculis duabus hujus coloris ad costæ medium; abdominis lateralibus coccineis.

Hab. GUATEMALA (fide *Dr. Staudinger*).

The specimen described above was kindly submitted to us by Dr. Staudinger as coming from Guatemala, and in the same box was such a characteristic Guatemalan species as *Anæa excellens*. This is the only evidence of the existence of a *Necyria* from that country.

The specimen referred to was not in good condition and the antennæ were missing; but we nevertheless think it well to give a figure of so interesting a butterfly.

MONETHE.

Themone, Section B. *Monethe*, Westwood, Gen. Diurn. Lep. p. 462 (1851).

Two species have been recognized as belonging to this genus, to which we now add a third; these are sparingly distributed over tropical America from Nicaragua to South Brazil; this latter locality requires confirmation, resting at present on a specimen in the British Museum, said to have come from Rio Janeiro.

The subcostal branch of the primaries in *M. albertus* emits one branch before the end of the cell and two after it; the middle discocellular is short and meets the subcostal almost at a right angle; the upper radial meets the subcostal a little beyond the cell; the lower discocellular is atrophied towards its upper end, it meets the median at an acute angle beyond the second branch; the costal side of the cell is shorter than the median. The secondaries have a basal nervure; the upper discocellular meets the subcostal beyond the first branch at a wide obtuse angle; the lower discocellular meets the median at an acute angle beyond the second branch; the costal side of the cell is much shorter than the median side.

The front legs of the male have the trochanter inserted beyond the middle of the coxa; the femur $> \frac{1}{2}$ coxa, slightly dilated towards the distal end; tibia = coxa, dilated in the middle; tarsus short, single-jointed $< \frac{1}{2}$ tibia. Terminal joint of palpi very small and slender = $\frac{1}{4}$ middle joint, which tapers slightly towards the extremity; basal joint short = $\frac{1}{4}$ middle joint.

The harpagones have two short blunt setose lobes towards the extremity on the outer side; a central piece arches over the penis and sends outward two blunt setose lobes on either side of the middle; a broad filament thickly covered with papillæ apparently proceeds from the penis; the strap from the base of the penis proceeds outwards as far as the end of the harpagones, it is then splayed out laterally and turned back to their base.

1. *Monethe rudolphus*, sp. n.

Alis nigris, area discali et anticis macula subapicali flavis; subtus ut supra sed macula anticearum apicali multo majore fasciam formante; posticis maculis quinque submarginalibus albis notatis, macula frontali

utrinque, altera pone oculos, palpis (præter apices), pedibus plerumque, et striis duabus abdominalibus, flavis.

Hab. NICARAGUA, Chontales (*Belt*).—COLOMBIA.

This species may be distinguished from *M. albertus* by the submarginal row of white spots on the secondaries beneath, the allied species having a single yellow spot near the anal angle of the secondaries. *Belt's* Chontales collection contained a single male example, the only one known from our country; we have another obtained near Muzo, in Colombia, by the plant-collector Chesterton; a third, formerly in the Kaden collection, was perhaps from Venezuela.

b'. Middle discocellular of the primaries atrophied*.

NOTHEME.

Themone, Section *Notheme*, Westwood, Gen. Diurn. Lep. p. 462 (1851).

Amblygonia, Feld. Reise d. Nov. Lep. p. 308.

We are not acquainted with *Amblygonia amarynthina*, doubtfully referred to this genus by Mr. Bates. *N. eumeus*, the only species known to us, has a wide range, as will be seen below.

The subcostal nervure of the primaries emits one branch before the end of the cell and two after it; the upper radial and the atrophied middle discocellular meet the subcostal at the same point, the latter at an acute angle; the lower discocellular is also atrophied and meets the median close to the origin of the second branch; the costal side of the cell is longer than the median side. The secondaries have a long basal nervure; the upper discocellular is atrophied, and leaves the subcostal a little beyond the first branch and makes an abrupt angle with the radial; the atrophied lower discocellular can hardly be traced, but it meets the median opposite the origin of the second branch; the costal side of the cell is shorter than the median side. The front legs of the male have a short coxa; the trochanter is inserted a little beyond the middle; the femur $> \frac{1}{2}$ coxa, tibia = coxa, tarsus < tibia. Front leg of the female has the terminal joint of the tarsus = second, it has a small setose pad beneath; the first, second, third, and fourth joints have each a strong spine at the end. The palpi of the male have a rather slender terminal joint = $\frac{1}{4}$ the middle joint, which tapers slightly towards the distal end; basal joint < $\frac{1}{2}$ middle joint; the terminal joint in the female is long and slender $> \frac{1}{2}$ middle joint, and $>$ basal joint. The antennæ have forty-one joints, the terminal thirteen forming a moderate club.

The secondary male sexual organs have the tegumen normal. The harpagones terminate in a blunt slightly upturned lobe; another piece starts from the base of the harpagones and meets above the penis, in a central blunt spine with two upturned teeth at the extremity; it also emits two lateral lobes setose towards their extremity;

* Extra-limital genera of this division are *Panara*, *Themone*, *Oreas*, and *Syrmatia*.

beneath the penis, near its proximal end and slightly diverging from it, is another chitinous piece; towards its distal end it turns upwards and bifurcates laterally, each fork terminating on the inside with a roughened pad without setæ.

1. *Notheme eumeus*.

Papilio eumeus, Fabr. Sp. Ins. ii. p. 63¹.

Notheme eumeus, Butl. Cat. Fabr. Diurn. Lep. p. 142².

Papilio erota, Cr. Pap. Ex. t. 276. f. G³.

Papilio ouranus, Cr. Pap. Ex. t. 335. f. C⁴.

Notheme ouranus, Bates, Journ. Linn. Soc. Zool. ix. p. 425⁵.

Amblygonia agathon, Feld. Reise d. Nov. p. 308, t. 37. f. 25, 26⁶.

Alis fusco-nigris, ciliis nigris, ad apices albis: fascia communi mediana albida, in posticis utraque aurantio terminata; posticis fasciola metallica submarginali, subtus ut supra sed fasciola metallica absente.

♀ mari similis, sed alis fuscescentioribus, anticis magis abbreviatis.

Hab. GUATEMALA, Pantaleon, Boca Nueva in the Polochic valley (*Champion*); NICARAGUA, Chontales (*Janson*).—SOUTH AMERICA, Colombia to Guiana^{1 3 4} and Eastern Brazil⁶.

Of this southern species we have received a few specimens from widely distant points within our limits, where it must be a scarce insect. The most northern examples hardly differ from others from the Amazons valley, except, perhaps, that the band of the wings is rather wider, whiter, and less fawn-colour.

Mr. Champion only met with this species in the forest-region of the “tierra caliente.”

CYRENIA.

Cyrenia, Westwood, Gen. Diurn. Lep. p. 435 (1851).

If we except *Erycina belphegor* of Westwood, doubtfully referred by Mr. Bates to this genus, there are but two closely allied species of *Cyrenia*, one of which ranges over the Amazons valley, the other is found in Panama. Mr. Bates places it between *Lyropteryx* and *Hades* in his Monograph on the Erycinidæ; but it seems to us to have no very near connection with either form.

The subcostal nervure of the primaries in *C. martia* emits one branch before the end of the cell and two after it; the discocellulars are nearly in a line and atrophied towards the middle; the upper discocellular makes an acute angle with the subcostal, meeting it at the same point as the upper radial; the lower discocellular meets the median at right angles at a little beyond the second branch; the costal side of the cell is considerably longer than the median side. The secondaries have a strong basal nervure; the discocellulars are atrophied, the upper meeting the subcostal at an obtuse angle a little beyond the first branch, the lower the median a little beyond the second branch; the costal side of the cell is shorter than the median side.

The front legs of the male have the trochanter inserted in the middle of the coxa;

the femur $=\frac{1}{2}$ coxa; tibia $=\frac{3}{4}$ coxa, much swollen throughout its length, its width in the middle being about one third its length; there is a depression at the distal end, the tarsus being absent. The palpi have a somewhat long and slender terminal joint $=\frac{1}{3}$ middle joint. The antennæ have fifty joints, whereof seventeen form a very gradual club. Eyes hairy.

There are no peculiarities in the tegumen of the male secondary sexual organs; the harpagones are two rather slender ascending lobes dentate at the extremity and setose at the outer end; there is apparently an arch over the penis bearing a triangular lobe on either side, dentate and setose along its upper surface; the penis itself is deflexed almost into a semicircle; a strap proceeds from its base outwards to between the harpagones, and is then bent abruptly to their base.

1. *Cyrenia pyrippe*. (Tab. XLI. figg. 13, 14.)

Cyrenia pyrippe, Godm. & Salv. P. Z. S. 1878, p. 362¹.

Alis fuscis, anticis ad basin indistincte nigro translineatis, plaga discali elliptica alba; posticis plaga albida fere obsoleta marginem externum versus, maculis duabus, una ad medium marginis interni, altera ad costæ medium, coccineis; subtus fere ut supra, plaga alba posticarum multo magis distincta; abdomine subtus rufo-ochraceo; posticis valde rotundatis.

Hab. PANAMA, Veraguas (*Arcé*¹).

The single specimen of this *Cyrenia* we described in 1878 is the only one we have yet seen. Its ally, *C. martia*, is found in Colombia, and thence spreads throughout the Amazons valley to Guiana.

C. pyrippe differs from its congener in having shorter, more rounded secondaries, the white spot on which is nearly obsolete on the upper surface and placed nearer the outer margin. The red spots, too, beneath are much smaller.

ITHOMEIS.

Ithomeis, Bates, Trans. Linn. Soc. xxiii. p. 541 (1862).

We are acquainted with eight species of this genus, which is remarkable for the resemblance its members bear to certain species of *Ithomia* and *Eresia*. Its range is chiefly confined to the Amazons valley; but two species occur in Colombia and one enters our region, being found in Costa Rica and the adjoining portion of the State of Panama.

The subcostal nervure of the primaries in *I. heliconina* emits one branch before the end of the cell and two after it*; the middle discocellular and the upper radial meet the subcostal almost at the same point, but in the male a very short upper discocellular

* Mr. Bates, in his description of this genus, states that the subcostal has two branches; but he seems to have mistaken the lower fork of the subcostal for the upper radial. We have examined every species of the genus, and the number of subcostal branches is invariably three.

can be traced; the lower discocellular is atrophied towards the upper end, and meets the median a little beyond the second branch; the costal side of the cell is a little shorter than the median side. The secondaries have a long basal nervure; the upper discocellular is atrophied for the greater part of its length, it meets the subcostal at a large obtuse angle a little beyond the first branch; the lower discocellular is atrophied towards its upper end, and meets the median beyond the second branch; the costal side of the cell is shorter than the median side.

The front legs of the male have the trochanter inserted beyond the middle of the coxa; the femur $=\frac{1}{2}$ coxa; tibia = coxa, dilated in the middle; tarsus $=\frac{2}{3}$ tibia. The terminal tarsal joint of the female = three preceding joints, with a large setose pad on the under surface; the second, third, and fourth joints terminate with a strong spine. The palpi have a very short terminal joint $=\frac{1}{6}$ middle joint, which tapers gradually towards its distal end, the basal joint is dilated $=\frac{1}{3}$ middle joint. Antennae with forty-three joints, and terminating with a slender club. The harpagones terminate in two short stout setose lobes; above the penis is a single long depressed spine. The penis itself is slightly decurved, blunt at the extremity; a strap connects it with the base of the harpagones, running outwards and then curving abruptly back.

1. ***Ithomeis imitatrix*.** (Tab. XLI. figg. 15, 16 ♂, 17 ♀.)

Ithomeis imitatrix, Godm. & Salv. P. Z. S. 1878, p. 362¹.

Ithomeis eulema, Butl. & Druce, P. Z. S. 1874, p. 353².

Alis nigris, anticis apice alba, maculis sex margini externo subparallelis ochraceo-albidis, tribus ad costam proximis elongatis, maculis duabus inter ramos medianos et una in cellula ejusdem coloris, fascia infracellulari et posticis præter marginem externum saturate fulvis, posticarum margine externo albo punctato; subtus sicut supra, costa posticarum saturate fulva; prothorace utrinque albo punctato, fronte alba, abdomine fulvo supra, medialiter fusco.

♀ mari similis sed major, et maculis anticarum magis ochraceis.

Hab. COSTA RICA (*Van Patten*²), Cache, Irazu (*Rogers*¹); PANAMA, Veraguas (*Arcé*¹).

This *Ithomeis* is certainly very closely allied to *I. eulema*, Hew., differing in its primaries being blacker at the base, the fulvous streak being very small or altogether wanting. The black border of the secondaries is wider towards the anal angle, instead of being nearly parallel throughout.

It is no doubt a form of *I. eulema*; and perhaps, when a larger series is examined, not to be separated from that species.

The homœochromatic associates of *I. imitatrix* are *Eresia pæcilina*, *Callithomia hezia*, *Euterpe dismorphina*, &c.

TMETOGLENE.

Tmetoglène, Felder, Wien. ent. Monatsch. vi. p. 235 (vice *Brachyglenis*, p. 73).

Metapheles, Bates, Ent. Monthl. Mag. iii. p. 155.

We now know of four species belonging to this genus (two of which are here described for the first time), three of them being found in our region; the fourth is from Brazil, the extreme southern limit of the genus.

We have dissected specimens of *Tmetoglène esthema* and *T. dodone*, and we find in them no tangible generic differences. *Metapheles dinora* appears to be essentially the same so far as external characters go, nor can we trace the difference in the neurulation of the primaries spoken of by Mr. Bates when he described the genus; all the peculiar markings of the body are similar in both types; we therefore unite them under one genus.

The subcostal nervure of the primaries in *T. esthema* emits one branch before the end of the cell and two after it; the upper radial meets the subcostal beyond the end of the cell; the middle discocellular is atrophied, and meets the subcostal at an acute angle a little beyond the first branch; the lower discocellular is atrophied towards its upper end; it meets the median at an acute angle a little beyond the second branch; the costal side of the cell is very little shorter than the median side. The secondaries have a basal nervure; the discocellulars are atrophied towards the middle, the upper meets the subcostal a little before the first branch, the lower the median just beyond the second branch; the costal side is much shorter than the median side; the cells of both wings are very short. In *T. dodone* the first subcostal branch of the primaries anchyloses with the costal, but to a different extent in the wings of the same insect.

The front legs in the male of *T. esthema* have the trochanter inserted a little beyond the middle of the coxa, the femur = $\frac{2}{3}$ coxa, tibia > coxa, tarsus = femur + trochanter; in *M. dodone* both the coxa and tibia are rather stouter. The palpi (*M. dodone*) have a short terminal joint = $\frac{1}{4}$ middle joint, which is stout, tapering gradually towards the end; the basal joint is dilated and longer than the terminal joint.

The harpagones have two lobes: the upper one is narrow and directed forwards, the lower one springs from the base and is long and club-shaped, and extends upwards to the lobes of the tegumen. The strap to the penis, after proceeding forwards, bends back to the base of the harpagone; at the angle a long piece projects outwards in the middle line. These parts are practically the same in *T. dodone*; the lower lobe of the harpagones is shorter.

1. *Tmetoglène dinora*. (Tab. XLII. fig. 1.)

Metapheles dinora, Bates, Ent. Monthl. Mag. iii. p. 155¹.

Alis hyalinis; marginibus, venis omnibus et fascia in anticis obliqua ultracellulari a costa ad angulum analem transeunte nigris latissime nitido-cyaneo lavatis; anticis plaga ultra fasciam transversam albicante venis divisa; fronte nigra utrinque alba; cruribus anticis albis; abdomine cyaneo-nigro utrinque ochraceo-rufis. ♀ mari similis, anticis ut semper magis rotundatis.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Calobre (*Arcé*¹).

The only specimen from the State of Panama in our collection is the male described by Mr. Bates in 1866. From Nicaragua we have a female taken by Belt.

We doubt whether this species is found in the southern continent. A Brazilian insect much resembling *T. dinora* in general appearance often stands for it in collections. This we describe below in order to clear up the confusion *.

T. dinora is readily distinguished by the beautiful blue gloss on the upper side of the wings. This blue colour also extends to the abdomen, which has a large ochre patch on either side, but no white lines.

2. *Tmetoglène dodone*, sp. n. (Tab. XLII. figg. 2, 3 ♂, 4 ♀.)

T. dinoræ similis sed alis multo minus hyalinis, venis latius nigris, colore cyaneo, haud nitido.

Hab. COSTA RICA (*Carmiol*); PANAMA, Volcan de Chiriqui (*Champion*), Chiriqui (*Ribbe*, *Zahn*).

This species of *Tmetoglène* is much more abundant than *T. dinora*, being found commonly at Chiriqui, where, so far as we know, *T. dinora* does not occur. Its range northwards is also more limited, not reaching Nicaragua. It is therefore possible that these two allied species do not coexist in the same area. That they are distinct species there can be no doubt, as reference to the figures will show.

Found on the margins of the forest and second-growth woods (*Champion*).

3. *Tmetoglène esthema*.

Brachyglenis esthema, Feld. Wien. ent. Monatschr. vi. p. 73¹.

Tmetoglène esthema, Feld. Reise d. Nov. Lep. p. 306, t. 38. f. 15, 16².

Alis canescentibus, venis omnibus, anticarum costa et apice, margine externo quoque fuscis cœruleo vix tinctis; anticis fascia venis divisa subapicali albicante; subtus ut supra sed omnino albicantioribus; fronte nigra utrinque alba; cruribus anticis albis; abdomine lateraliter ochraceo.

Obs. A *T. dinora* et *T. dodone* anticarum fascia transversa lata ultracellulari fere absente, alis latioribus minus productis, posticarum angule anali magis acute differt.

Hab. PANAMA, Chiriqui (*Ribbe*).—RIO NEGRO^{1 2}; ECUADOR; BOLIVIA.

The blue gloss on the wings of this species is more conspicuous in fresh specimens. It is readily distinguishable from its allies by the several characters pointed out above, though the general resemblance is obvious.

Dr. Felder's type came from the Rio Negro¹; the species has since been traced to

* *Tmetoglène drymo*, sp. n.

T. dinoræ primo visu sat similis, colore cyaneo alarum fere absente; posticarum margine interno albo striato, abdomine supra et infra albo longitudinaliter bistrato, et anticis subtus ad basin macula ochraceo-rufa notatis distinguenda.

Hab. BRAZIL, S. Paolo (*Rogers*).

Mus. nostr.

Ecuador and Bolivia, where Buckley procured specimens in both countries. In our region it has as yet only been caught in the neighbourhood of Chiriqui ; and here only by Herr Ribbe, Mr. Champion not having met with it.

LEPRICORNIS.

Lepricornis, Felder, Reise d. Nov. Lep. p. 307.

This genus was based by Felder upon a single specimen obtained by Sallé in Mexico, and a second species from South Brazil was placed in it by Butler. Of the last-named insect we have several examples ; but we are unwilling to describe this as typical without comparing them with the actual type.

Felder's generic characters are as follows:—"Antennæ sat breves, crassiusculæ, in clavam elongatam, excavatam sensim increscentes, squamis subpatulis piliformibus (præsertim apud articulos) dense tectæ. Palpi crassiusculi, faciem superantes. Alæ integerrimæ, ecaudatæ, sat latæ, anticæ vena subcostali triramosa, ramo primo non multo ante, secundo proxime pone cellulæ clausum ascendente, vena discoidali superiore e vena subcostali sat longe post cellulæ extimum oriente, inferiore bene supra venulæ discocellularis medium emissa, ramo mediano secundo et tertio bene distantibus, posticæ vena costali brevi ante costæ medium excurrente, cellula discoidali brevissima, ramo mediano secundo et tertio in conditione ordinaria, sed interstitiis venæ primariæ medianæ sat brevibus."

1. *Lepricornis melanchroia*.

Lepricornis melanchroia, Felder, Reise d. Nov. Lep. p. 307, t. 38. f. 25.

"Alæ anticæ costa pone medium deflexa, supra omnes fumato-nigrescenti-fusæ, margine externo excepto chalybeo suffusæ, radiis dilutius chalybeis inter venas (in anticis solum in regione basali et interna), anticæ fascia subapicali margines non attingente subdiffusa chalybeo alba e maculis quatuor confluentibus ; alæ subtus ut supra, radiis chalybeis tantum angustioribus lætioribus anticarumque fascia angustiore, palpi et cellare aurantiaco fulva." (Felder, *loc. cit.*)

Hab. MEXICO (*Sallé*¹).

We have never met with this species, the type of Felder's genus *Lepricornis*.

2. *Lepricornis bicolor*, sp. nov. (Tab. XLIII. fig. 13.)

Alis brunneo-nigris area interna et macula magna in regione anticarum apicali aurantiacis, macula inter antennis, collari, stria utrinque corporis, macula frontali, palpis (præter apices), pedibus et abdomine subtus ejusdem coloris, fronte superiori cirrosa nigerrima, antennis omnino nigris.

Hab. PANAMA, Bugaba (*Champion*).

We have a single specimen of this species. The thickened antennæ, of nearly uniform width throughout, resemble those of *Lepricornis atricolor* ; and the neuration, so far as we can examine it, agrees with the description given by Felder of the genus and also with the species just mentioned. The peculiar tuft of decurved black hairs

on the upper part of the forehead is noteworthy, and when a proper dissection is made other differences may be revealed.

This species greatly resembles a day-flying moth frequenting the same forest region of the low country (*Champion*).

CHAMÆLIMNAS.

Chamælimnas, Felder, Reise d. Nov. Lep. p. 304.

This genus contains six species, distributed between the State of Panama and Southern Brazil. Of these one only just enters our borders, a single specimen of the Colombian *C. villagomes* having been taken by Herr Ribbe near Panama.

The subcostal nervure of the primaries of *C. briola* emits one branch before the end of the cell and two after it; the middle discocellular and the upper radial meet the subcostal at the same point, the former making an acute angle with the subcostal; the lower discocellular is atrophied towards the upper end and meets the median just beyond the second branch. The secondaries have a basal nervure; the upper discocellular is short and meets the subcostal at an obtuse angle beyond the first branch; the lower discocellular is atrophied and meets the median some way beyond the second branch.

The front legs of the male have the trochanter inserted beyond the middle of the coxa, the femur is very short $< \frac{1}{3}$ coxa, tibia > 2 femur, tarsus $= \frac{1}{2}$ tibia (single jointed). Palpi have a short terminal joint slender, $= \frac{1}{4}$ middle joint, which is swollen towards the middle, the basal joint is long, dilated, and $> \frac{1}{2}$ middle joint. Antennæ with about thirty-three joints, the terminal thirteen forming a slender club.

The harpagones are very feeble lobes, slightly setose at the ends; between them is a piece arching over the penis and produced forward to a blunt point, setose at the end, and bearing a lateral lobe on either side also setose at the end. The strap from the base of the penis is produced forward to beyond the harpagones, where it turns slightly upwards; it then is bent abruptly backward to their base; the penis tapers gradually to the end and is bent almost to a semicircle. The bursa copulatrix of the female has two very small smooth chitinous papillæ.

1. *Chamælimnas villagomes*. (Tab. XLI. fig. 8.)

Chamælimnas villagomes, Hew. Trans. Ent. Soc. 1870, p. 163¹; Ex. Butt., *Chamælimnas* and *Ithomiola*, fig. 6².

Alis nigris, anticis plaga mediana elliptica et striola discali longitudinali aurantiis, posticis dimidio basali coloris ejusdem, macula frontali supra palpos quoque aurantia.

Hab. PANAMA, Chiriqui (*Ribbe, mus. Staudinger*).—ECUADOR^{1 2}.

This species has several close allies in *C. briola* and *C. phanias* and others; but a characteristic feature distinguishes it, viz. the orange spot in front of the head.

It is only known to us as an inhabitant of our region from a single specimen taken by Herr Ribbe in Chiriqui, which was kindly submitted to us for examination by Dr. Standinger.

CHIMASTRUM, gen. nov.

The primaries rounded, costa and outer margin outwardly convex, inner margin nearly straight. The subcostal nervure emits one branch before the end of the cell, and two afterwards; the upper radial joins the subcostal some way beyond the second branch and far beyond the end of the cell; the middle discocellular meets the subcostal at an acute angle, and is slightly curved and atrophied for most of its length; the lower discocellular is also convex and atrophied for its upper half, it meets the median some way beyond the second branch; the costal and median sides of the cell are nearly equal; the secondaries are rounded; there is a strong basal nervure; the upper discocellular meets the subcostal at an obtuse angle before the first branch, the lower discocellular the median at an acute angle some distance beyond the second branch; the costal side of the cell is shorter than the median side.

The front legs of the male have the trochanter inserted about the middle of the coxa; the femur $=\frac{1}{2}$ coxa and slightly dilated towards its distal end, tibia=coxa, tarsus=femur. The front leg of the female has the terminal tarsal joint a little longer than the second joint, and a setose pad beneath; the second, third, and fourth joints terminate beneath with a pair of spines. The palpi are peculiar in that the terminal joint seems to be fused with the middle joint—there is not even a constriction showing an atrophied joint; the basal joint is short. There are thirty-one joints in the antennæ, whereof the terminal eleven form a well-defined club.

The secondary sexual organs of the male have the harpagones with a single lobe, rather acute and setose towards its extremity; the penis is short, truncate, and decurved, and either within its cavity or attached to its sheath are two patches of long strong spines; the usual strap proceeds from its base to the base of the harpagones.

In the female the bursa copulatrix has two short blunt granular spines, and the duct leading to it is much enlarged towards its external orifice; it is corrugated towards the middle and granular.

The alliances of this genus are somewhat complex. The neurulation of the primaries differs essentially from that of *Mesene* in that the subcostal nervure emits one branch before and two after the end of the cell, thus resembling to some extent *Chæmelimnas*; the position of the upper radial corresponds with neither genus. The palpi are also peculiar, as are the male organs, though these bear some slight relationship in both sexes to those of *Esthemopsis*. We place the genus in this position solely in virtue of the neurulation of its wings.

1. **Chimastrum argenteum.** (*Mesene argentea*, Tab. XLII. fig. 28.)

Mesene argentea, Bates, Ent. Monthl. Mag. iii. p. 154¹.

Mesene hewitsoni, Boisd. Lép. Guat. p. 22².

Alis niveis undique, præter margines externos, nigro circumcinctis; alis ad basin, thorace, palpis et cruribus anticis, pallide ochraceis.

♀ mari similis.

Hab. GUATEMALA², Polochic valley (*Hague*¹), Panima, Cubilguitz, Teleman (*Champion*); PANAMA, Chiriqui (*Ribbe*), Bugaba (*Champion*).

We have now a considerable series of this pretty species from Guatemala and the State of Panama, where it would appear to be fairly abundant in certain districts, frequenting dense humid forests of the low country.

Esthemopsis carnutes, Hew. (Ex. Butt. *Erycina*, *Symmachia*, &c.), of Colombia, appears to be strictly congeneric with *C. argenteum*.

The moth *Astyochia crane* (Druce, Biol. Centr.-Am. Lep. Het. i. p. 158, t. 14. f. 18, 19), especially the female, is very like *C. argenteum* in size and colour.

c. Subcostal nervure of primaries with two branches emitted before and one after the end of the cell.

c'. Palpi not projecting beyond the forehead.

a". Antennæ without white or pale rings*.

LIMNAS.

Limnas, Boisduval, Sp. Gén. i. t. 20. f. 1 (1836); Westw. Gen. Diurn. Lep. p. 459.

After removing *Limnas bryaxis* and its allies from this genus, there remain about twenty-five species strictly belonging to it: these are distributed throughout Tropical America, from Mexico to South Brazil. Only four species occur within our limits, all of them found in Mexico or Guatemala, and only one of them, *L. jarbas*, extending southwards to Ecuador and Guiana.

The subcostal nervure of the primaries of *L. pixe* emits two branches before the end of the cell, and one after it; the discocellulars are both atrophied as they approach the lower radial; the middle discocellular and upper radial meet the subcostal nearly at the same point; the lower discocellular meets the median a little beyond the second branch; the costal side of the cell is nearly equal to the median side. The secondaries have a strong basal nervure; the discocellulars are atrophied—the upper meets the subcostal beyond the first branch, the lower meets the median beyond the second branch; the costal side of the cell is considerably shorter than the median side.

* *Barbicornis*, *Xenandra*, *Lucilla*, and *Pheles* come into this division, and probably *Dryas*.

The front legs of the male have the trochanter inserted beyond the middle of the coxa; the femur is $< \frac{1}{2}$ coxa, dilated towards its distal end; tibia=coxa dilated in the middle; tarsus (two-jointed)=femur+trochanter. The terminal tarsal joint of the female=second joint; the first, second, third, and fourth joints terminate beneath with strong spines; there are other spines beneath on the first and second joints. The terminal joint of the palpi is short, about $= \frac{1}{5}$ middle joint, the basal joint is much dilated and $= \frac{1}{3}$ middle joint. Antennæ with forty joints, of which the terminal fifteen form a moderate club.

The tegumen in the secondary organs of the male is normal; the harpagones are lobes terminating in a slightly upturned point, and are setose on their outer surface towards the end; above the penis is an arch armed externally with a setose lobe on either side; the strap which proceeds from the base of the penis reaches forward as far as the end of the harpagones; it is there splayed out and returns abruptly to the base of the harpagones. The penis itself is bent almost to a semicircle, and terminates in an abrupt point, a little before which are two small dentations on the upper side, and a filament of uncertain shape proceeds from the orifice a little further back.

1. *Limnas pixe*.

Limnas pixe, Boisd. Sp. Gén. t. 20. f. 1¹; Léop. Guat. p. 26²; Butl. & Druce, P. Z. S. 1874, p. 353³.

Alis nigris, anticarum apicibus flavis, macula ad basin, altera ad posticarum basin et serie submarginali coccineis; subtus omnino similis; abdominis lateralibus coccineo maculatis.

♀ mari similis, anticis magis rotundatis.

Obs. Alæ anticæ maris interdum ad angulum analem maculis una duabus aut tribus coccineis ornatae.

Hab. MEXICO¹ (*Sallé*², *Deppe*), Cordova (*Rümelin*, *Höge*), Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*), Belize (*Blancaneaux*); GUATEMALA, Polochic valley and Central Guatemala (*F. D. G. & O. S.*), Panima, Chiacam, Cahabon, Zapote, Paraiso (*Champion*); HONDURAS²; NICARAGUA, Chontales (*Belt*, *Janson*); COSTA RICA (*Van Patten*³); PANAMA, Bugaba (*Champion*, *Arcé*), Calobre (*Arcé*).

Boisduval says in his Lepidoptera of Guatemala², that the specimen he figured in his "Species Général" was obtained in Mexico, by M. Sallé; but some years previously Deppe had sent examples to the Berlin Museum, where we saw them a short time ago. *Limnas pixe* is a common insect in Southern Mexico, and throughout Central America, as far as the district of Veraguas, in the State of Panama. It frequents the hotter forest country, up to an elevation of about 3000 feet.

There is considerable variation in the size and number of the red spots at the anal angles of the primaries in this species. These spots do not exist in Mexican specimens. In Guatemala some are without them, others have as many as three, and the same is the case in examples from the State of Panama. The Calobre individuals have all the red spots large, and of rather a yellower shade than is usual.

BIOL. CENTR.-AMER., Rhopal., Vol. I., January 1886.

2. *Limnas jarbas*.

Papilio jarbas, Fabr. Mant. Ins. ii. p. 83¹.

Lymnas jarbas, Butl. Cat. Fabr. Diurn. Lep. p. 143².

Papilio electron, Fabr. Ent. Syst. iii. p. 321³.

Limnas melantho, Ménétr. En. Corp. An. Mus. Petr. i. p. 93, t. 3. f. 7⁴; Bates, Journ. Linn. Soc. Zool. ix. p. 426⁵; Boisd. Lép. Guat. p. 26⁶.

Alis nigris ad basin macula coccinea notatis, anticis fascia transversa ultracellulari, apice (interdum) et posticarum margine externo præcipue ad angulum analem aurantio-flavis; subtus omnino ut supra venis vix pallidioribus.

Hab. GUATEMALA, La Tinta (*Champion*); HONDURAS (*Dyson*²); NICARAGUA^{4 5 6}.—COLOMBIA; ECUADOR; VENEZUELA²; TRINIDAD; GUIANA^{1 2 3}.

This *Limnas* can readily be distinguished from *L. pixe* by the yellow band which crosses the primaries, the apex in the latter species being yellow.

In Central America *L. jarbas* appears to be very scarce. Though recorded from Nicaragua many years ago, we have only a single specimen from thence, and Mr. Champion captured only one during the whole of his stay in Guatemala, and never met with it in the State of Panama at all.

The Nicaraguan insect was described by Ménétrié as *L. melantho*, but we are unable to distinguish it from the South American form. The small yellow spot at the apex of the primaries is a very variable character, and of no specific value. The yellow edging to the secondaries is also variable, but in *L. jarbas* seems always to include, not only the fringe, but also a portion of the wing. In *L. melander*, to which *L. jarbas* is intimately allied, the fringe alone is coloured yellow, and is even dark in some cases.

3. *Limnas cephise*.

Lyropteryx cephise, Ménétr. En. Corp. An. Mus. Petrop. i. p. 89, t. 3. f. 3¹.

Limnas cephise, Bates, Journ. Linn. Soc. Zool. ix. p. 427².

Alis sordide nigris, venis omnibus albicantibus macula coccinea ad basin notatis; subtus omnino ut supra, posticis macula altera coccinea ad basin costæ ornatis.

Hab. MEXICO, Mazatlan (*Forrer*); NICARAGUA² (*Delattre*¹).

We have recently received from Mr. Forrer a specimen of this species, taken near Mazatlan in Mexico, which agrees in all respects with others from Nicaragua, and with Ménétrié's figure. This specimen was captured in the same locality as others of *L. acroleuca*—a somewhat remarkable fact, if the latter species be really distinct.

Like *L. jarbas*, *L. cephise* seems to be rare in Central America; besides the Mexican locality above mentioned and Nicaragua, we know of no other place where it is found.

4. *Limnas acroleuca*.

Limnas acroleuca, R. Feld. Verh. k.-k. zool.-bot. Ges. Wien, 1869, p. 467¹.

L. cephise affinis sed alis nigricantioribus et anticis albo ad apicem terminatis forsan distinguenda.

Hab. MEXICO, Mazatlan (*Forrer*), Huahuapan (*Hedemann*¹), Oaxaca (*Deppe*).

It is perhaps doubtful if this insect is really separable from *L. cephise*. Almost the only tangible difference is the presence in the former of a white tip to the apex of the primaries, not seen in the latter. This character of a white or yellow apex in species of *Limnas* is one that shows considerable variation, and we use it to differentiate *L. acroleuca* with some hesitation.

The first specimens of this insect sent to Europe were those obtained by Deppe at Oaxaca, which are now in the Berlin Museum. It has since been found at various places, but seems to be more abundant near Mazatlan than elsewhere.

ESTHEMOPSIS.

Esthemopsis, Feld. Reise d. Nov. Lep. p. 306 (1865).

Pseudopheles, Bates, Trans. Ent. Soc. ser. iii. v. p. 544.

Esthemopsis clonia is the type of this genus, a species discovered in Colombia by Lindig, and now traced northward through the State of Panama to Nicaragua.

The genus contains nine or ten species, all agreeing fairly well in their generic characters; with these we now include two others which have some characters in common with *Esthemopsis*, while others are certainly aberrant, but as each of these species is represented by a single individual, we are unwilling to attempt to place them definitely, and they will be found at the end of the account of the family.

The northern limit of the range of *Esthemopsis* is Guatemala; thence it passes southwards throughout the Amazons valley to Maranham in North Brazil. Four species occur within our region, one of which is the aberrant form referred to above.

The subcostal nervure of the primaries of *E. clonia* emits two branches before the end of the cell and one beyond it; the upper radial meets the subcostal beyond the cell; the atrophied middle discocellular is at right angles to the subcostal; the lower discocellular is bent in the middle, the upper half atrophied, the lower meeting the median some way beyond the origin of the second branch; the costal and median sides of the cell are subequal. Secondaries with a strong basal nervure, both discocellulars atrophied, the upper meeting the subcostal at an obtuse angle beyond the origin of the first branch, the lower meeting the median at a large acute angle beyond the origin of the second branch; the costal side of the cell is shorter than the median side. The front legs of the male have the coxa considerably produced beyond the trochanter-coxal joint; the femur = $\frac{2}{3}$ coxa, dilated towards the distal end; tibia > femur + trochanter, tarsus = tibia, two-jointed, with two short setæ at the extremity. The front legs of the female have the second joint nearly equal to the fifth, the fourth

being the shortest. Antennæ gradually taper towards the extremity, having an abrupt club. The palpi have a very small terminal joint, the middle one tolerably stout, tapering towards the extremity and about four times as long as the terminal joint.

The secondary sexual organs of the male have the tegumen with two lobes, setose on their outer surface towards the ends; between them is a short depressed hook, and in the middle what appears to be a central keel, on either side also a strong incurved hook. The harpagones bilobed, the lower lobe incurved, and both setose outside towards the distal end. The penis is short and truncate, with a broad strap dilated in the middle between it and the base of the harpagones; inside are two rows of dentate papillæ which in our preparation reach to a little beyond the orifice; there is also a strong chitinous piece, apparently dependent from the penis, upturned with an outwardly serrate edge; the precise attachments of this piece are not clear in our preparation.

1. *Esthemopsis clonia*.

Esthemopsis clonia, Feld. Reise d. Nov. Lep. p. 306, t. 38. ff. 11, 12¹; Butl. & Druce, P. Z. S. 1874, p. 353².

Alis chalybeo-nigris, anticis fascia arcuata macularum quinque aut sex albarum subapicali a costa ad marginem externum (interdum ad angulum analem) transeunte, posticis maculis quinque aut sex guttiformibus submarginalibus notatis; subtus fere ut supra; prothorace lateraliter, fronte et palpis rubris; cruribus anticis fuscis.

♀ mari similis.

Hab. NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*²); PANAMA, Bugaba (*Champion*).—COLOMBIA¹.

Colombian specimens upon which the name was founded have the white band of the primaries rather broader than Central-American examples; but there seems to be no essential difference.

E. clonia has a much wider range than *E. strigosa*, being not uncommon in Nicaragua and extending into Colombia, *E. strigosa* being, so far as we know, confined to the district of Chiriqui, where it is much more common than its more widely diffused ally.

It was found by Mr. Champion in the forest region of the low country west of Bugaba. It greatly resembles a day-flying moth frequenting the same locality.

2. *Esthemopsis strigosa*.

Esthemopsis strigosus, Staud. Verh. k.-k. zool.-bot. Ges. Wien. 1875, p. 110¹.

Alis nigris cyanescenti vix tinctis, anticis fascia macularum quatuor fere recta ultracellulari a costa ad medium marginis externi transeunte, striolis inter ramos medianos et venis posticarum canescentibus; subtus ut supra sed striolis canescentibus magis obviis; prothorace lateraliter et palpis aurantiis; cruribus fuscis.

♀ mari similis.

Hab. PANAMA, Chiriqui (*Ribbe*¹), Bugaba (*Champion*).

This species is, as Dr. Staudinger says, closely allied to *E. clonia*, one of the chief differences being in the band of the primaries, which in *E. strigosa* consists of four spots in a nearly straight row, and in *E. clonia* of five or six in a curve. The radiating stripes between the nervules are more marked in *E. strigosa*, whence its name.

Herr Ribbe supplied Dr. Staudinger with his types, and we have examples from the same source, and also several others sent us by Mr. Champion, who met with it in the same district frequented by *E. clonia*.

3. *Esthemopsis alicia*. (Tab. XLI. figg. 18, 19.)

Pheles alicia, Bates, Ent. Monthl. Mag. i. p. 203¹.

Esthemopsis alicia, Bates, Journ. Linn. Soc. Zool. ix. p. 433².

Alis chalybeo-nigris, anticis fascia obliqua subapicali venis divisa alba; subtus ut supra, posticis cæruleo radialis; prothorace undique, fronte et palpis rubris; cruribus anticis fuscis, medialiter albidis.

♀ nobis ignota.

Hab. GUATEMALA², forests of Northern Vera Paz (*F. D. G. & O. S.*¹), Polochic valley, Choctum (*Hague*).

Of this species we captured a single male specimen in the forest-region of Vera Paz, north of Coban, at an altitude of about 1200 feet above the sea; and from the same district, as well as from the valley of the Polochic, Mr. Hague sent us three other examples. Mr. Champion did not meet with it.

The insect figured as this species by Hewitson is distinct, for not only is the band of the primaries different, but the prothorax and palpi are black.

4. *Esthemopsis* (?) *cæruleata*. (Tab. XLI. figg. 6, 7.)

Limnas cæruleata, Godm. & Salv. P. Z. S. 1878, p. 362¹.

Alis cæruleo-nigris, anticis fascia transversa ultracellulari flava; subtus anticis ut supra colore cæruleo absente; posticis lincis cæruleis longitudinalibus ad angulum analem ornatis; fronte et cruribus anticis flavis.

Hab. PANAMA, Chiriqui (*Ribbe*¹).

The single specimen of this species obtained by Herr Ribbe in Chiriqui is the only one we have yet met with. We are in some doubt as to the correct position of the species, which was originally referred to the genus *Limnas*. On further consideration we now think it belongs rather to *Esthemopsis*, but until we obtain sufficient materials to make a fuller dissection we must leave the matter in doubt. We can detect no outward structural character not shared by *Esthemopsis*; and the anal angle of the secondaries being somewhat produced corresponds with what we find in such species as *Esthemopsis clonia*, while the radiating blue lines on the secondaries beneath resemble those of *E. alicia*.

E. cæruleata would be an abnormal species as regards its coloration in any genus yet known to us, but has some features in common with *Lucilla*.

MESENOPSIS, gen. nov.

We find, on dissection, that the so-called *Limnas bryaxis* of Hewitson cannot be retained in that genus. Not only are there slight differences in the neururation, but the structure of the male secondary organs differs so widely that it seems necessary to place it elsewhere. The latter characters suggest a relationship with *Mesene* and *Cricosoma*, and we accordingly place it near those genera.

We recognize three, perhaps four, species as belonging to this genus, two of which belong to our region; a third is from Western Colombia*; and a fourth, represented by a fragment which formed part of the late Mr. Belt's Maranham collection, is from Northern Brazil. This latter specimen may prove to belong to our *M. melanochlorus*.

The subcostal branch of the primaries of *M. bryaxis* emits two branches before the end of the cell and one after it; the discocellulars are atrophied, the middle one and the upper radial meet the subcostal at the same point, the lower one the median a little beyond the second branch; the costal side of the cell is a little longer than the median side. The secondaries have a strong basal nervure; the atrophied upper discocellular meets the subcostal opposite the first branch, the lower the median beyond the second branch; the costal side of the cell is a little longer than the median side. The trochanter of the front legs of the male is inserted in the coxa a little beyond the middle; the femur $< \frac{1}{2}$ coxa, dilated towards its distal end, tibia = about $\frac{3}{4}$ coxa, tarsus (single-jointed) = $\frac{3}{4}$ tibia. The terminal tarsal joint in the legs of the female is about = second and has a setose pad beneath; the first, second, and third joints terminate beneath with two strong spines; the fourth has three, and there are other spines on the third and fourth beneath. The terminal joint of the palpi is short = $\frac{1}{4}$ middle joint, which is somewhat dilated in the middle; the basal joint is long turgid $> \frac{1}{2}$ middle joint.

The secondary male sexual organs have a normal tegumen; the harpagones are simple, terminating above in an acute angle; beneath is a strong spine in the middle line, connected below with the base of the harpagones. The penis is short and truncate, and inside the orifice at its extremity are numerous patches of dentate papillæ, which are probably attached to filaments and capable of extrusion, as in *Cricosoma*.

1. *Mesenopsis bryaxis*.

Limnas (?) *bryaxis*, Hew. Ent. Monthl. Mag. vi. p. 227¹; Ex. Butt., *Limnas*, 3. f. 20, 21².

* *Mesenopsis briseis*, sp. n.

M. bryaxi similis, sed minor, fasciis alarum flavis haud margines exteriores attingentibus, marginibus his late nigris distinguenda.

Hab. COLOMBIA, San Pablo, R. San Juan (*Trötsch*).

We are indebted to Dr. Staudinger for a pair of this species.

Alis nigris, ambabus fascia lata longitudinali flava; subtus omnino ut supra, posticarum angulo anali flavido; fronte, palpis, tectricibus alarum, cruribus anticis et abdominis lateribus flavis.

♀ mari similis fascia flava latiore et pallidiore.

Hab. NICARAGUA, Chontales (*Belt*^{1 2}, *Janson*).

Belt obtained many specimens of this species, and others were taken by Janson.

In shape and colour it closely resembles *Flavinia læta*, a moth found in the same districts (Druce, Biol. Centr.-Am. Lep.-Het. i. p. 150).

2. *Mesenopsis melanochlora*. (*Limnas melanochlorus*, Tab. XLI. fig. 5.)

Limnas melanochlora, Godm. & Salv. P. Z. S. 1878, p. 362¹.

L. bryaxi similis, fascia alarum angustiore et magis aurantia, et lateribus suis fere parallelibus distinguenda.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Chiriqui (*Ribbe*¹), Bugaba (*Champion*).

In its style of coloration this species closely resembles *L. bryaxis*, but we have no doubt that it is really distinct. The yellow longitudinal bands of the wings are of nearly equal width throughout, instead of being subtriangular, and their colour is decidedly richer.

It is a much rarer species than *L. bryaxis*—three specimens only, one from Chontales and two from Chiriqui, being all we have seen.

In the latter country Mr. Champion found it in the forest region of the low country west of Bugaba.

Josia ligata, a moth found at Bugaba, is very like this species in size and colour (Druce, Biol. Centr.-Am. Lep.-Het. i. p. 148).

b''. Antennæ with white rings or spots*.

SYMMACHIA.

Symphachia, Hübner, Verz. bek. Schmett. pp. 25, 26 (1816); Westwood, Gen. Diurn. Lep. p. 444 (1851).

After removing the section of this genus the wings of which are of a metallic green, and for which we have revived Hübner's name *Caria*, there remain about twenty-five species of true *Symphachia*, of which nine are found within our limits; of these, only three also occur in South America, leaving six peculiar. No less than eight species occur in Nicaragua; this is perhaps due to the great attention paid to them by Belt, with whom the genus was a special favourite.

The primaries in *S. threissa* have the costa waved; the subcostal nervure emits two branches before the end of the cell and one after it; the discocellulars are atrophied; the middle meets the subcostal at nearly the same point as the lower radial (*S. menetis* has a very short upper discocellular), the lower the median some way beyond the

* This division includes the following South-American genera:—*Siseme*, *Rhicdina*, *Amarynthia*, *Zelotea*, *Imelda*, and *Dysmathia*.

second branch; the costal side of the cell is a little longer than the median side. The secondaries have a basal nervure; the discocellulars are atrophied; the upper meets the subcostal a little beyond the first branch, the lower the median a little beyond the second branch; the costal side of the cell is shorter than the median side. The front legs of the male in *S. menetas* have the trochanter inserted about the middle of the coxa; femur = $\frac{1}{2}$ coxa, tibia = $\frac{2}{3}$ coxa, tarsus = tibia: there is a slight constriction showing the remains of a joint. The terminal joint of the palpi (in *S. menetas*) is short and slightly swollen, = $\frac{1}{4}$ middle joint; basal joint being rather long and much dilated towards its distal end.

The harpagones in the male (*S. threissa*) are very short obtuse and setose at the extremity; the penis is short and truncate, and near its extremity is an elongated patch of delicate spines. In *S. menetas* the harpagones are still very short and have two lobes, both setose; the spines of the penis are much denser and more numerous. In *S. probetor* the harpagones have a single lobe; the spines of the penis, though dense, are not so many in number.

a. Wings pale brown.

1. *Symmachia emesia*.

Symmachia emesia, Hew. Ex. Butt., *Symmachia*, f. 7¹; Bates, Journ. Linn. Soc. Zool. ix. p. 437².

Alis fulvis, lineolis transversis interruptis fuscis, macula irregulari costali semidiaphana ultra cellulam anticarum; subtus ut supra sed alis pallidioribus et lineolis rufescentioribus.

Hab. NICARAGUA^{1 2} (*Mus. Hew. et nost.*).

We have a single male specimen of this insect which was formerly in Mr. Bates's collection, and a female is in the Hewitson collection. The species seems to have escaped the notice of both Belt and Janson.

The alliance of *S. emesia* is with *S. fatima*, from which it differs in being duller in colour and in the spots above not being metallic.

2. *Symmachia yucatanensis*.

S. emesia similis, sed alis supra multo fusciscentioribus maculis et lineolis magis distinctis.

Hab. MEXICO, Valladolid in Yucatan (*Gaumer*).

We have four examples of this *Symmachia* from Yucatan. It is closely allied to *S. emesia*, but differs in the points mentioned above.

b. Costa of secondaries of male red.

3. *Symmachia accusatrix*.

Symmachia accusatrix, Westw. in Doubl. & Hew. Gen. Diurn. Lep. p. 445¹; Bates, Journ. Linn. Soc. Zool. ix. p. 438².

Alis fusco-nigris, anticis viridi certa luce micantibus, macula ad cellulæ finem et quinque ultra eam elongatis,

ad angulum apicalem semihyalinis; posticis area costali coccinea, margine interno albido; subtus alis brunescens, alis ut supra maculatis, cellula quoque albo bimaculata, posticis maculis variis albidis notatis; palpis ochraceo-rufis, abdomine utrinque rufo lineato et subtus albo transfasciato.

♀ alis bruneis, anticis lineola submarginali et maculis ad basin coccineis, maculis alteris flavis; subtus flavo maculatis linea submarginali aurantio-rufa.

Hab. GUATEMALA, Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*); PANAMA, Chiriqui (*Ribbe*), Chitra (*Arce*).—AMAZONS VALLEY^{1 2}; GUIANA.

As will be seen above, this species has an extensive range, but throughout is very constant, specimens from Guatemala and the Lower Amazons presenting no tangible points of difference. Mr. Belt, with whom *Symmachia* was a favourite genus, captured a good series of specimens at Chontales.

4. *Symmachia threissa*.

Symmachia threissa, Hew. Ent. Monthl. Mag. vi. p. 227¹; Ex. Butt., *Symmachia*, 2, and *Charis*, 2, f. 19².

Alis chalybeo-nigris, anticis macula parva triangulari diaphana ad cellulæ finem; posticis area cellulari coccinea; subtus fusco-nigricantibus, posticis punctis albidis vix maculatis; abdominis lateribus coccineis.

♀ nobis ignota.

Hab. NICARAGUA, Chontales (*Belt*^{1 2}).

To the late Mr. Belt we are indebted for this species, of which he took a good many examples.

5. *Symmachia championi*, sp. n.

Alis viridi-nigris, maculis ad basin anticarum pure nigris, posticarum area costali coccinea; subtus fuscis, posticis maculis albidis variis vix notatis.

♀ alis fuscis, anticis plaga apicali et maculis variis basalibus ferrugineis, costa ultra cellulam maculis tribus albidis; posticis sordide albo-indistincte maculatis; subtus pallidioribus.

Hab. GUATEMALA, San Gerónimo (*Champion*).

This and the next species strongly resemble *S. probetor* of the Amazons and Guiana, but there are differences in both sexes which render them easy to be distinguished. The present species may at once be recognized by the black spots at the base of the primaries of the male, and the female by its generally darker colour, all the spots being very small.

Mr. Champion's specimens were all captured at San Gerónimo, and include a pair taken together; the species inhabits humid places in the second-growth woods at an elevation of 3000 feet.

6. *Symmachia belti*, sp. n.

S. championi similis, sed paulo minor, maculis nigris ad basin anticarum nullis, plaga magna a margine interno ad cellulam deinde ad angulum apicalem producta nigra.

♀ alis marginibus externis rufis nigro maculatis, posticis undique maculis rufis adspersis, subtus maculis omnibus sordide albis, multo majoribus.

BIOL. CENTR.-AMER., Rhopal., Vol. I., January 1886.

3 H

Hab. NICARAGUA, Chontales (*Belt*).—COLOMBIA.

This species is still more nearly allied to *S. probetor* than the last-mentioned one. The male may be recognized by the dark patch on the primaries spreading outwards towards the apical angle. In the female the spots are rufous instead of being nearly white; and in *S. probetor* there is a narrow submarginal red line not seen in the present insect.

A good many specimens of this species were in Belt's collection, and we are pleased at the opportunity of connecting his name with a genus of which he collected no less than eight species during his residence at Chontales.

c. Primaries of male spotted, discal area of secondaries dull red.

7. *Symmachia cleonyma*.

Symmachia cleonyma, Hew. Ent. Monthl. Mag. vii. p. 4¹; Ex. Butt., *Symmachia*, 2, and *Charis*, 2, ff. 12, 13².

Alis lacte brunneis, anticis rubro intra cellulam maculatis, maculis submarginalibus in serie duplici positis, fulvis; posticis medialiter rubris; subtus fuscis griseo-albidis præcipue in posticis undique maculatis; prothorace, tectricibus alarum et abdominis lateribus rubris, cruribus anticis sordide albis.

♀ nobis ignota.

Hab. NICARAGUA, Chontales (*Belt*^{1 2}).

This was another of Mr. Belt's discoveries in Nicaragua, whence alone we have seen examples. It comes nearest to *S. juratrix* of the Amazons valley, which is, however, a much larger insect, besides differing in other respects.

8. *Symmachia leena*.

Symmachia leena, Hew. Ent. Monthl. Mag. vi. p. 226¹; Ex. Butt., *Symmachia*, 2, and *Charis*, 2, ff. 14, 15².

Alis brunneis saturate rubro maculatis, in posticis confluentibus, maculis quibusdam aliis ad costam et anticarum angulum apicalem, albidis: posticis ad medium marginis interni penicillatis; posticis fuscis griseo-albido sparsim maculatis.

Hab. NICARAGUA, Chontales (*Belt*^{1 2}).

We have what we believe to be a female of this insect, but it is in such an injured condition as to be unfit for description. Though a much smaller insect, *S. leena* has a general resemblance to *S. cleonyma*, but the peculiar tuft of hair situated on the secondaries, between the median and submedian nervures, at once distinguishes it, not only from *S. cleonyma*, but from all other members of the genus, except that from Colombia which we describe below*.

* *Symmachia harmodius*.

S. leenæ similis sed anticis brunneis fere immaculatis distinguendus.

Hab. Rio San Juan, Western Colombia.

We are indebted to Dr. Staudinger for two specimens of this insect, which formed part of an interesting collection made by Herr Trötsch.

d. Inner half of primaries and whole of secondaries bright reddish orange.

9. *Symmachia rubina*. (Tab. XLII. fig. 12.)

Symmachia rubina, Bates, Ent. Monthl. Mag. iii. p. 155¹.

Emesis irata, Butl. Cist. Ent. i. p. 12².

Alis testaceo-rubris, anticis dimidio costali nigris, striis duabus costalibus et tribus ad apicem costæ subparallelis punctisque duabus inter eas sordide albis, posticis angulo apicali nigro.

Hab. GUATEMALA, Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*); PANAMA, Veraguas (*Arcé*¹), San Lorenzo (*Champion*), Lion Hill (*M^cLeannan*).—COLOMBIA².

Mr. Bates described this species from examples in our collection from Panama, whence we trace it northwards to Guatemala. Two female specimens from the latter country have indications of a submarginal row of black spots on the secondaries, but this alone will hardly justify their separation.

The type of Mr. Butler's *Emesis irata*, a female, is in our collection, and can be exactly matched in our Panama series.

There is a slight amount of variation in the amount of black at the base of the primaries. Some specimens have a spot isolated from the rest of the black border, in others it is joined to it, in others, again, it is wanting altogether.

S. menetis (Drury) is an allied species from Brazil which may be distinguished by the black border to the secondaries, a character which also separates other forms found in the valley of the Amazons.

Found in the dense forest region of "the tierra caliente" (*Champion*).

CRICOSOMA.

Cricosoma, Felder, Reise d. Nov. Lep. p. 292.

Seven or eight species of this genus are known to us, chiefly belonging to the Amazons region, but found also in the neighbourhood of Bahia in Eastern Brazil, and as far north as Nicaragua within our country. It is closely allied to *Mesene*, but we find differences in the male organs which probably warrant its separation.

The subcostal nervure of the primaries emits two branches before the end of the cell and one after it; the upper radial and the atrophied middle discocellular leave the subcostal at the same point; the lower discocellular is also atrophied and meets the median a little beyond the second branch; the costal and median sides of the cell are nearly equal. The secondaries have a basal nervure; the upper discocellular leaves the subcostal a little beyond the first branch, the lower meets the median beyond the second branch; the costal and median sides of the cell are nearly equal.

The front legs of the male are slender, the coxa extends far beyond the trochanter joint, femur $> \frac{2}{3}$ coxa, tibia = coxa, tarsus $>$ tibia and has two joints and two setæ at the end. The front legs of the female have the second and last joints about equal, and greater than the third and fourth, the last has a setose pad on the under surface, the rest have two strong spines at the extremity of the under surface. The

terminal joint of the palpi is very small and about one fourth the middle one; the basal joint being long and $> \frac{1}{2}$ middle joint. The antennæ have thirty-nine joints, the terminal fourteen forming a moderate club.

The tegumen in the male has an even terminal edge, and there are two strong lateral hooks; the harpagones extend upwards, and are then bent outwards, and are terminated in a narrow setose lobe, they seem to be united beneath into a long strong spine. The penis is a broad truncate tube, from the interior of which proceed three filaments strongly armed with dentate papillæ; there is no strap proceeding from the penis to the base of the harpagones. In addition, there is a peculiarity in the male of *Cricosoma xypete* which we have not noticed elsewhere: between the second and third segments of the abdomen are peculiar patches of scales, one on either side; these scales are of bulbous shape, and terminate in a spine with a knob at the end; there are also similar patches between the third and fourth segments.

1. *Cricosoma xypete*.

Mesene xypete, Hew. Ent. Monthl. Mag. vi. p. 227¹; Ex Butt., Erycinidæ, ff. 8, 9².

Alis testaceo-rubris, marginibus externis et punctis submarginalibus nigris, anticis costa maculis transversis sex notata; subtus ut supra, alis ad basin nigro punctatis, linea submarginali puncta nigra includente flavida.

♀ mari similis sed alis pallidioribus maculis nigris magis distinctis, posticis lineis duabus submarginalibus notatis.

Hab. NICARAGUA, Chontales (*Belt*^{1 2}, *Janson*); PANAMA, Chiriqui, Calobre (*Arcé*).

This is a very distinct species, having no near allies, so far as we know. *C. phædra* of Bates probably comes closest to it, but the black spots on the wings are nearly evenly distributed in that species, whereas in *C. xypete* the internal area is plain-coloured.

It is a tolerably common insect in Nicaragua, where Belt discovered it; it occurs again in the State of Panama, but we have not seen specimens from the neighbourhood of Chiriqui, which is somewhat strange, considering how thoroughly this district has been investigated.

MESENE.

Mesene, Westwood, Gen. Diurn. Lep. p. 441.

We know of about forty-five species belonging to this genus, and these are spread over the whole of Tropical America from Southern Mexico to Peru. Ten species occur within our limits, of which no less than seven are peculiar. In coloration great variety is shown amongst the different species, by which means the genus may be separated into tolerably distinct groups, some of which may prove to be of generic value when more minute dissections have been instituted.

The subcostal nervure of the primaries of *M. hedemanni* emits two branches before the end of the cell and one after it; the middle discocellular and upper radial meet the subcostal very nearly at the same point, the lower discocellular meets the median nervure beyond its second branch, both discocellulars being atrophied; the costal and median sides of the cell are subequal. The secondaries have a strong basal nervure;

the discocellulars are atrophied—the upper one meets the subcostal a little beyond the first branch, the lower one joins the median a little beyond the second branch; the costal and median sides of the cell are subequal.

The front legs of the male of *M. phareus* are slender, the trochanter is inserted before the middle of the coxa, femur $< \frac{1}{2}$ coxa, tibia $= \frac{3}{4}$ coxa, tarsus = tibia. The front legs of the female (*M. hedemanni*) have the second and fifth tarsal joints about equal, the latter having a strong setose pad on the under surface; the fourth joint is the shortest, and the first, second, third, and fourth terminate beneath with two strong spines. The terminal joint of the palpi is very small and oval, $< \frac{1}{4}$ the middle joint, which is nearly uniform in width throughout, the basal joint $> \frac{1}{2}$ middle joint. Antennæ have thirty-nine joints, the terminal thirteen forming a moderate club.

The male organs are very similar to those of *Cricosoma*, so far as regards the tegumen. The harpagones are subtriangular in shape, and have an irregular outer edge, the upper portion of which, as well as the upper edge, is setose. The penis in general form is like that of *Cricosoma*, and it also has two or three series of strong dentate papillæ which may or may not be capable of extrusion. There is a curved strap connecting the penis with the harpagones as in many genera of the Erycinidæ, but which is absent in *Cricosoma*. There is no central spine between the harpagones as in that genus. The bursa copulatrix of *M. hedemanni* has a chitinous spine, two being visible in *M. leucopus* and none in *Cricosoma*.

In other respects the structure of *M. leucopus* is quite similar to that of *C. hedemanni*.

a. Wings mottled beneath, sexes dissimilar.

1. **Mesene ignicauda.** (Tab. XLII. figg. 19, 20 ♂, 21 ♀.)

Mesene ignicauda, Godm. & Salv. P. Z. S. 1878, p. 363¹.

Alis nigris, posticis macula in margine interno et abdomine rubra; subtus obscure fuscis, maculis nigris griseo marginatis dense notatis.

♀ mari similis, sed macula rubra posticarum fere ad finem cellulæ anticarum producta; subtus macula rubra anticarum ut supra, abdomine obscuro.

Hab. PANAMA, Chiriqui (*Ribbe*), Bugaba (*Champion*), Veraguas (*Arcé*¹).

This species is allied to *M. ærope* of the Amazons valley, but the male differs in having a red abdomen, and the female in the red bands of the primaries not crossing the wings.

Mr. Champion found it in the low forest region west of Bugaba.

b. Wings of male black beneath, sexes dissimilar.

2. **Mesene phœnicura**, sp. n.

Alis saturate fuscis, lineis obscuris indistincte transfasciatis, abdominis apice rubro; subtus saturate fuscis, immaculatis.

♀ ignota.

Hab. NICARAGUA, Chontales (*Belt*).—COLOMBIA.

Of this curious species we have a single specimen from Belt's collection which agrees with two others from Western Colombia sent us by Dr. Staudinger.

It has no near allies that we are acquainted with, but has a faint resemblance to *M. fuliginea* of the Amazons valley, from which it may be at once distinguished by the absence of markings on the wings beneath, and by the red apex to the abdomen.

3. *Mesene tyriotes*.

Mesene tyriotes, Godm. & Salv. P. Z. S. 1878, p. 363¹.

Alis nigro-fuscis, fascia lata per medium alarum posticarum et corporis aurantio-rubra transeunte; subtus nigro-fuscis unicoloribus.

♀ alis obscure fuscis, anticis fascia aurantio-rubra (quam in mare pallidiori) a costae medio ad angulum analem transeunte; subtus ut supra sed pallidioribus.

Hab. GUATEMALA, Choctum (*Haue*); NICARAGUA, Chontales (*Belt*); PANAMA, Chiriqui (*Ribbe*), Calobre (*Arcé*¹).

This is a northern form of the common *M. sagaris* of South America, and may readily be distinguished by the red band of the secondaries not entering the internal margin of the primaries as in the allied species. *M. crocostigma* is also an allied form, but has the abdomen wholly dusky.

Though widely distributed in Central America, but few specimens of this species have reached us, and it appears to be much rarer than the allied form, which enjoys an extensive range over nearly the whole of tropical South America.

c. Wings beneath and above similar.

d. Secondaries rounded.

4. *Mesene rubella*. (Tab. XLII. figg. 22 ♂, 23, 24 ♀.)

Mesene rubella, Bates, Ent. Monthl. Mag. i. p. 204¹.

Alis testaceo-coecineis, marginibus et fasciola ad cellulae anticarum finem angusto nigris; subtus ut supra sed anticarum dimidio costali, apice, et marginibus externis fuscis.

♀ mari similis sed alis pallidioribus; subtus omnino ut supra, anticarum costa tantum fusca.

Hab. GUATEMALA, Choctum (*Haue*); NICARAGUA, Chontales (*Belt*); PANAMA, David (*Champion*), Veraguas (*Arcé*), Lion Hill (*M. Leannan*¹).

This species is allied to the common *M. phareus* of South America, but differs in having the wings more narrowly bordered with black, and in the costal half only of the primaries beneath being dusky, and there are no whitish spots on the dusky margin of the secondaries.

Mr. Bates described this species from a somewhat faded female specimen sent us from Panama, and he speaks of it as paler in colour than the same sex of *M. phareus*; the receipt of subsequent examples, however, shows that there is no material difference in this respect between these two species.

5. **Mesene croceella.** (Tab. XLII. figg. 25, 26 ♂, 27 ♀.)

Mesene croceella, Bates, Ent. Monthl. Mag. i. p. 204¹.

Alis croceis marginibus nigricantibus; subtus ut supra.

♀ mari similis.

Hab. MEXICO, Potrero (*Hedemann, Mus. Vindob.*); GUATEMALA, Motagua valley (*F. D. G. & O. S.*¹), San Gerónimo (*Hague, Champion*); NICARAGUA, Chontales (*Belt*).

This was also described by Mr. Bates from a single specimen, which was not in good condition, the fore legs being wanting, so that the sex cannot be determined by this character. Mr. Bates considered it to be a male, but from the shape of the wings we have no doubt it is a female. It is allied to *M. rubella*, but differs in the more saffron colour of the wings, the absence of any mark at the end of the cell of the primaries, and by the dusky colour of those wings beneath being restricted to the costa and the outer margins. We have now several specimens of this pretty species from Guatemala, and others from Nicaragua which only differ in being rather smaller.

Found in second-growth woods (*Champion*).

Eudule invaria (Druce, Biol. Centr.-Am. Lep.-Het. i. p. 137), a common Central-American moth, resembles *M. croceella* in size and colour.

6. **Mesene margaretta.**

Agathina margaretta, White, Zool. 1843, p. 28¹.

Mesene margaretta, Bates, Journ. Linn. Soc. Zool. ix. p. 440².

Mesene semiradiata, Feld. Reise d. Nov. Lep. p. 292, t. 37. ff. 27, 28³.

Alis testaceo-rufis, anticis triente apicali nigro, albido radiato, posticis margine externo nigro, intus profundo serrato et albido notato; subtus ut supra sed alis pallidioribus, posticarum margine distincte radiato.

♀ mari omnino similis sed alis pallidioribus.

Hab. MEXICO, Cordova (*Hedemann, Mus. Vindob., Rümeli*); GUATEMALA, Zapote (*Champion*); HONDURAS^{1 2}; PANAMA, Calobre (*Arcé*²).—COLOMBIA^{2 3}.

A widely ranging species, but everywhere scarce. Mr. Champion only took a single specimen in the forests near Zapote.

A point of interest in this peculiarly marked species is its resemblance to a moth, *Pseudomennis coccinea* (Druce, Biol. Centr.-Am. Lep.-Het. i. p. 152, t. 14. f. 11), which is also found in Central America.

7. **Mesene leucopus**, sp. n.

Alis flavidis, marginibus externis latis, anticarum costa et apice fuscis; subtus omnino ut supra, cruribus anticis albidis.

♀ mari similis, alarum marginibus fuscis angustioribus.

Hab. GUATEMALA, San Gerónimo (*Champion*).

Of this species Mr. Champion obtained a good series of specimens in Guatemala, where alone it has been found, in second-growth woods at an elevation of 3000 feet. It has a near ally in *M. silaris* of Nicaragua, but differs in its larger size and in having white instead of black fore legs.

8. *Mesene silaris*. (Tab. XLII. fig. 29.)

Mesene silaris, Godm. & Salv. P. Z. S. 1878, p. 363¹.

M. leucopo similis, cruribus anticis nigris facile distinguenda.

Hab. NICARAGUA, Chontales (*Belt*¹).

Our specimens of this species are from Belt's collection in Nicaragua, from whence alone we have received it. Its black front legs easily distinguish it from its near ally *M. leucopus*.

9. *Mesene barce*.

Bæotis barce, Hew. Ex. Butt., Lemonias and Bæotis, f. 7¹.

Alis rufescenti-brunneis, anticis macula parva ad cellulæ finem, altera ad medium marginis interni, aurantiacis, posticis fascia transversa ejusdem coloris bipartitis; subtus ut supra. Exp. al. 0.9 in.

Hab. MEXICO (*G. Mathew*¹).

The only specimen we have seen of this distinct species is that in the Hewitson collection in the British Museum. This was obtained by Mr. Gervase Mathew of the Royal Navy, who took it in Mexico, probably near to some port on the west coast.

The palpi being short, and not projecting beyond the forehead, indicate that this species should be placed in *Mesene* and not in *Bæotis*. Its nearest ally is perhaps *Mesene monogramma* (Bates), synonyms of which are *Bæotis quadrinota*, Butl. Cist. Ent. ii. p. 32, and *B. barzanes*, Hew. Ex. Butt., Erycinidæ, f. 2.

b'. Anal angle of secondaries produced.

10. *Mesene hedemanni*.

Mesene hedemanni, R. Feld. Verh. k. k. zool.-bot. Ges. Wien, 1869, p. 468¹.

Mesene niciades, Boisd. Lép. Guat. p. 22².

Alis nigro-fuscis, anticis fascia interna et plaga elongata obliqua ultra cellulam flavidis; posticis fascia basali alteraque submarginali ejusdem coloris; subtus ut supra fasciis pallidioribus; abdomine fusco ad basin flavido cincto.

♀ mari similis sed fasciis pallidioribus.

Hab. MEXICO, Paso del Macho near Cordova (*Hedemann*¹); GUATEMALA², Chiacam, Panima, Cahabon (*Champion*), Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*); COSTA RICA, Cache (*Rogers*); PANAMA, Bugaba, Volcan de Chiriqui (*Champion*), Chiriqui (*Ribbe*).—COLOMBIA.

A species allied to *M. tricolor* (*Symmachia tricolor*, Hew.), with which it has often been confounded. *M. tricolor* on the upper side has the transverse outer spots much more rufescent; beneath the primaries have a discal streak parallel to the costa, and the secondaries have a yellowish patch near the middle of the inner margin, neither of which marks are found in *M. hedemanni*.

This is a common species in the State of Panama and also in Nicaragua; but in Guate-

mala and Mexico it is rarer. We have no specimens from the latter country, though the types were procured there. Boisduval's type of *Mesene niciades*, kindly lent us by Mons. C. Oberthür, is a much rubbed female of this species.

Found in sunny openings in the forest (*Champion*).

PACHYTHONE.

Pachythone, Bates, Journ. Linn. Soc. Zool. ix. p. 389 (1868).

We know of nine species of this genus, which is distributed from Panama to South Brazil, five being found in the Amazons valley; two species occur within our limits, both in the State of Panama. All the members of this genus are very scarce insects, so much so that we have none to spare for dissection; we therefore copy Mr. Bates's diagnosis of the genus, and leave it in the same position in the family as he placed it.

"This new genus is formed to include a number of species very similar in size and range of coloration to *Mesene*, but differing in the much more bulky thorax and abdomen, and especially in the abbreviated and thickly clubbed antennæ. The wing venuration is the same as in *Mesene* and the allied genera; the palpi are very short, not passing the lower edge of the frontal pad; and the hind wings are broadly rounded, with the outer margin on about the same level as the anal angle. The antennæ scarcely reach to half the length of the costa of the fore wing; their shafts are brown, spotted obscurely with ash or lighter brown. Eyes naked. The male fore legs are very short; the other legs are moderately elongate and clothed with short scales."

1. *Pachythone philonis*.

Pachythone philonis, Hew. Ex. Butt., *Pachythone* and *Cremna*, ff. 3, 4¹.

Alis fusco-brunneis, anticis fascia aurantia a costæ medio fere ad angulum analem transeunte; subtus sicut supra, posticis fascia submarginali pallida vix obvia.

♂ nobis ignotus.

Hab. PANAMA, Chiriqui (*Ribbe*), Bugaba (*Champion*).—COLOMBIA¹.

We have some doubts whether this is really *P. philonis* of Hewitson, as our specimen shows no traces of any spots towards the base of the wing; the colour of the wings below is also much darker. Our materials, however, are too scanty to form a definite opinion as to whether there is more than one species.

Our single specimen was taken by Mr. Champion in the low forest region west of Bugaba, whence Herr Ribbe also sent Dr. Staudinger an example; both these are females, as are also the type of *P. philonis* and of an allied species, *P. palades*, from Brazil; the male therefore of this form of *Pachythone* remains yet to be discovered.

2. *Pachythone gigas*. (Tab. XLIV. fig. 25.)

Pachythone gigas, Godm. & Salv. P. Z. S. 1878, p. 364¹.

Alis nigris, anticis macula elliptica magna in triente apicali, altera acuta ad basin, per margine interno exten-

BIOL. CENTR.-AMER., Rhopal., Vol. I., January 1886.

dente, sed costam non attingente; posticis præter margines pallide flavis; subtus ut supra, posticarum margine nigro per costam totam non extendente.

Hab. PANAMA, line of railway (*Ribbe* ¹).

Described from a female in Dr. Staudinger's collection, taken by Herr Ribbe on the Isthmus of Panama. We have never seen another example of it. In its general appearance it is not unlike *P. mimula*, but is very much larger.

PARNES.

Parnes, Westwood, Gen. Diurn. Lep. p. 464 (1851).

Only two species are known to belong to this genus; both of them are found in the Amazons valley and Guiana, and a single specimen of *P. nycteis* has been taken in the State of Panama.

The subcostal nervure in the primaries of *P. nycteis* emits two branches before the end of the cell and one after it, the first branch anchyloses with the costal to a slight extent; the middle discocellular meets the upper radial just before the latter joins the subcostal so that there is a very short upper discocellular; the lower discocellular is atrophied towards its upper end, it meets the median a little beyond its second branch; the costal side of the cell is longer than the median side. The secondaries have a basal nervure; the discoidals are much atrophied, the upper meets the subcostal a little beyond the first branch, the lower the median opposite the second branch; the costal and median sides of the cell are about equal.

The front legs of the male have a very long coxa, the trochanter being inserted more than two thirds of its length from its base, the femur, tibia, and tarsus are all extremely short, the tibia being slightly the longest. The form of these legs much resembles that of *Perophthalma tenera* and *Mesosemia mollina*; the wings, however, have a very different neurulation. The palpi have a small terminal joint, = $\frac{1}{3}$ middle joint, which is dilated towards the middle. There are twenty-nine joints to the antennæ, of which the terminal ten form an abrupt club.

The harpagones of the secondary male organs are subtriangular, the lower side undulating, the apex pointing slightly upwards, and setose on the outer surface. The penis is short and slightly decurved, with the usual strap connecting it with the harpagones.

1. *Parnes nycteis*.

Parnes nycteis, Westw. in Doubl. & Hew. Gen. Diurn. Lep. p. 464, t. 73. f. 3¹.

Alis fuscis, subtus undique fulvo vermiculatis, marginibus externis ejusdem coloris, cillis fuscis, ocellis ad angulos apicales nigris albo bipupillatis.

Hab. PANAMA, Chiriqui (*mus. Staudinger*).—AMAZONS VALLEY; BRITISH GUIANA.

The only specimen we have seen of this little species from Central America was submitted to us by Dr. Staudinger; it agrees well with our series from the Amazons valley, except that the subapical ocelli are very small.

CHARIS.

Charis, Hübner, Verz. bek. Schmett. p. 21; Westwood, Gen. Diurn. Lep. p. 452.

Of this genus we are acquainted with about forty species, distributed throughout the whole of Tropical America from Mexico to South Brazil; two species occur beyond our northern frontier in the United States, and fourteen are found within our limits. The genus is divisible into several groups, which may be readily distinguished by their style of coloration. In general size the members of *Charis* resemble those of *Mesene*, and include some of the smallest of butterflies; but, apart from other characters, the constant presence in the former of submarginal metallic lines on the wings is a ready means by which it may be distinguished from the latter.

In *Charis zama* the subcostal nervure emits two branches before the end of the cell and one afterwards; the discocellulars are atrophied, the middle discocellular and the upper radial leave the subcostal at the same point, the lower discocellular meets the median a little below the second branch; the costal side of the cell is slightly longer than the median side. The secondaries have a strong basal nervure; the discocellulars are atrophied—the upper one meets the subcostal a little beyond the first branch, the lower meets the median a little beyond the second branch; the costal and median sides of the cell are subequal.

The front legs in the male of *C. holosticta* have the trochanter inserted before the middle of the coxa, femur = $\frac{1}{2}$ coxa, tibia < coxa, tarsus (two-jointed) = tibia. The front legs in the female (*C. zama*) have the terminal tarsal joint a little longer than the second, with a setose pad on the under surface; the fourth joint is the shortest, and the first, second, third, and fourth each terminate beneath with a strong spine.

The terminal joint of the palpi is very small and oval, about = $\frac{1}{4}$ middle joint, which is slender; basal joint turgid = $\frac{1}{2}$ middle joint.

The male secondary organs have a bilobed tegumen, each lobe being setose externally, and two strong lateral hooks. The harpagones are simple lobes, setose towards the extremity, and with two deep lacerations on the outer edge. The penis is simple, curved downwards, and pointed; a long strap extends from its base outwards, and then curves backwards and unites with the base of the harpagones.

There is no important difference in the structure of *Charis argyrodines* or of *C. holosticta*, but the latter has a stouter penis, with a row of papillæ.

a. Wings beneath suffused with metallic purple or blue.

1. *Charis cadmeis*. (Tab. XLIV. figg. 1, 2.)

Charis cadmeis, Hew. Ex. Butt., *Charis*, t. 1. f. 1¹; Bates, Journ. Linn. Soc. Zool. ix. p. 442².

Alis glauco-fuscis nigro irregulariter transfasciatis, punctis submarginalibus nigris, venis omnibus ad margines externos metallico-plumbeis, ciliis albis; subtus nitide viridescenti-cæruleis saturate cyaneo transfasciatis, punctis submarginalibus sicut supra,

Hab. COSTA RICA, Cache (*Rogers*).—ECUADOR; AMAZONS^{1 2}.

The only Central-American specimens we have received of this fine species are from Costa Rica; these agree accurately with specimens from the Amazons.

2. *Charis zama*.

Charis zama, Bates, Journ. Linn. Soc. Zool. ix. p. 392¹.

C. hermodoræ similis quoad alarum paginam superiorem; alis subtus purpureo-rufescentibus lineis nigris trans-fasciatis; posticis linea plumbea unica tantum notatis.

♀ mari similis sed alis subtus ferrugineis, ambabus linea unica submarginali plumbea notatis.

Hab. GUATEMALA, Polochic and Chisoy valleys (*Hague*), San Gerónimo, Panima, San Juan, Lanquin, Cahabon (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA, Cache (*Rogers*); PANAMA (*Hepburn*), Volcan de Chiriqui, Bugaba, David (*Champion*).—COLOMBIA; ECUADOR; AMAZONS VALLEY¹.

As Mr. Bates says, this is a common species throughout Tropical America, being abundant in the Amazons valley; it is equally so in Central America from Guatemala southwards. The purplish red tint of the primaries beneath renders it easily distinguishable from its allies; this colour varies to some extent in richness.

The females of typical Amazons examples are more distinctly spotted and altogether lighter in colour than is the case with our Central-American specimens, though we notice some variation in this respect.

Mr. Champion took specimens in second-growth woods and margins of the forest from sea-level to 3000 feet.

3. *Charis velutina*. (Tab. XLIV. figg. 3, 4.)

Charis velutina, Godm. & Salv. P. Z. S. 1878, p. 364¹.

Alis nigricanti-fuscis, lineis nigricantibus ad basin obsolete notatis, fasciis plus minusve integris ferrugineo-nigris, una ultra cellulas, altera submarginali, fasciis duabus plumbeis submarginalibus, interiori valde irregulari, exteriori integra; subtus saturate purpurescentibus lineolis valde obsoletis ad basin, lineola submarginali unica plumbea in anticis interrupta, cilia alterne fusca et alba.

♀ mari similis sed alis pallidioribus; subtus ferrugineo-fuscis, lineola anticarum submarginali plumbea haud interrupta.

Hab. MEXICO (*Deppe*); GUATEMALA, Polochic¹ and Chisoy valleys, Choctum (*Hague*), Zapote, Panima, Cahabon (*Champion*).

This very distinct *Charis* has its head quarters in Guatemala, where it is abundant, especially at Panima in the Sinanja valley. Like *C. avius* and *C. iris* the colouring of the under surface of the wings in the male is of a rich tint, but the colour itself is deep purple, and not blue as in those species.

4. *Charis avius*.

Papilio avius, Cram. Pap. Ex. t. 92 B¹.

Charis avius, Bates, Journ. Linn. Soc. Zool. ix. p. 443².

Supra *C. zamæ* similis, alis subtus lætissime cæruleis certa luce viridi-micantibus, maculis quibusdam evanescentibus obscuris, lineola submarginali plumbea aut evanescente aut omnino absente, cilia alterne fusca et alba.

♀ alis subtus obscure fuscis, haud ferrugineis, nigro distincte maculatis.

Hab. NICARAGUA, Chontales (*Belt, Janson*); PANAMA, Chiriqui (*Ribbe*), Volcan de Chiriqui, Bugaba (*Champion*).—SOUTH AMERICA, Colombia to Amazons and Guiana².

The only species with which this can be confounded is *C. iris*, but from it it may be readily distinguished by the colour of the cilia, by the evanescent spots on the wings beneath, and by the total absence of the plumbeous submarginal line. It is a common insect in the valley of the Amazons, and probably also in Guiana, whence Cramer's types were procured. In our country it is equally abundant in the State of Panama, and apparently also in Nicaragua, but we have not yet seen specimens from Costa Rica, whence *C. iris* alone has reached us.

It frequents the opener parts of the forest (*Champion*).

5. *Charis iris*.

Charis iris, Staud. Verh. k.-k. zool.-bot. Ges. Wien. xxv. p. 110¹.

C. avio proxima sed ciliis albis, alarum pagina inferiori lætissime cyaneo, immaculata, et lineola submarginali plumbea distinguenda.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA, Cache (*Rogers*); PANAMA, Chiriqui (*Ribbe*¹), Bugaba (*Champion*), Lion Hill (*M'Leannan*).—COLOMBIA.

This beautiful species is common in the neighbourhood of Chiriqui, whence Dr. Staudinger received his types. We also have specimens from as far north as Nicaragua, and it occurs too in Colombia. The pure white fringe of the wings, which only has a few dark spots in the primaries, is a ready character by which to distinguish it from its allies, especially from *C. avius*.

It occurs in the low-lying forest region west of Bugaba (*Champion*).

b. Wings beneath dark brown to fulvous.

6. *Charis hermodora*.

Charis hermodora, Feld. Wien. ent. Mon. v. p. 99¹; Bates, Journ. Linn. Soc. Zool. ix. p. 443².

Charis argyrea, Godm. & Salv. Trans. Ent. Soc. 1880, p. 125 (nec Bates)³.

Alis obscure fuscis, striis nigricantibus obsolete transvittatis, linea submarginali obscure ferruginea nigro punctato plumbeo utrinque limbata; subtus alis pallidioribus lineolis nigris magis distinctis, punctis submarginalibus paginæ superioris sed linea tantum unica submarginali plumbea.

♀ mari similis, lineolis omnibus magis distinctis, subtus sicut supra.

Hab. NICARAGUA?, Chontales (*Janson*); PANAMA, Calobre (*Arcé*), line of railway (*Ribbe*).—COLOMBIA³; VENEZUELA¹.

This species just enters our fauna, where, however, it appears to be scarce, its home being Venezuela, whence Dr. Felder's types now before us were derived, and the adjoining parts of Colombia.

C. argyrea of the Amazons valley is a closely allied species, but may be distinguished by the wings beneath having two submarginal plumbeous lines instead of one.

7. *Charis argyrodines*. (Tab. XLIV. figg. 5, 6.)

Charis argyrodines, Bates, Ent. Monthl. Mag. iii. p. 154¹; Journ. Linn. Soc. Zool. ix. p. 444².

C. hermodoræ similis, lineis paginæ superioris magis integris, fascia communi fusca sat distincta.

Hab. MEXICO, Pinos Altos in Chihuahua (*Buchan-Hepburn*), Tres Marias Islands, Milpas, Ventanas (*Forrer*), Jalapa (*Höge*), Cordova (*Rümeli*), Valladolid in Yucatan (*Gaumer*); GUATEMALA, Choctum, Polochic valley (*Hague*), San Gerónimo, Dueñas (*F. D. G. & O. S., Champion*), Zapote, San Jose de Guatemala (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*), Irazu, Cache, San Francisco (*Rogers*); PANAMA, Bugaba, Calobre (*Arcé*).—PERU; BRAZIL.

Guatemala specimens of this common insect, upon which Mr. Bates' description was based, are very constant, but directly we trace it beyond this area differences declare themselves on all sides; thus in Mexico we find specimens with somewhat elongated wings mingled with the ordinary type, and again others in which the dusky band common to both wings can scarcely be traced. In Yucatan a male example has the anal angle of the secondaries more produced than usual. In Nicaragua and Costa Rica similar divergences show themselves, and specimens of a pale colour, with the cross band very distinct, are decidedly numerous; these two have the outer margin of the primaries more irregular than in the typical form. A further divergence is indicated in a single specimen we possess from the Tres Marias Islands, but on such scanty materials it would be rash to draw definite conclusions. Brazilian specimens, of which we have several, conform very fairly to the Guatemala type.

In Guatemala *C. argyrodines* is a very common species, and may be seen flying in open places amongst bushes.

8. *Charis australis*.

Charis australis, W. H. Edwards, Field & Forest, iii. p. 87 (fide Strecker)¹.

Charis guadeloupe, Strecker, Rhop. Het. p. 131².

C. hermodoræ similis anticis magis productis, margine externo undulato, fascia communi fusca et colore subtus pallido forsan distinguenda.

Hab. NORTH AMERICA, Texas.—MEXICO, Sonora (*Morrison*).

Mr. Morrison sent us good series of specimens from our northern frontier marked *C. australis* of Edwards. These are very fairly uniform in their markings, and form a race certainly distinct from *C. canius*, and probably also from *C. argyrodines*.

9. *Charis laverna*.

Charis canius, Godm. & Salv. Trans. Ent. Soc. 1880, p. 125 (nec Linn.)¹.

Alis rufescenti-fuscis, lineolis nigris undique transvittatis, punctis nigris submarginalibus inter lineas duas plumbescentes; subtus ferrugineis nigro-maculatis punctis submarginalibus et lineis plumbeis ut supra, linea interna maculosa.

Hab. MEXICO, Presidio (*Forrer*); HONDURAS (*Mus. Brit.*); PANAMA, Volcan de

Chiriqui (*Champion*), Calobre (*Arcé*), Lion Hill (*M^e Leannan*).—COLOMBIA; VENEZUELA; BRAZIL.

We follow Mr. Bates and the American writers in applying the name of *C. cænius* (Linn.) to the North-American insect, although the Linnean description would equally suit any one of the southern races; but having applied it to the northern form, the southern appears to be without a designation; hence we name it as above.

It is closely allied to *C. cænius*, the only difference being the more pointed apex of the primaries. From *C. argyrodines* a tolerably definite character can be traced in the more uniform distribution of the dark spots on the wings, and the nearly total absence of the dark band which crosses both wings in the allied form. The two specimens from Presidio in Mexico we place here with some doubt; they are of a more russet colour above, and the plumbeous bands beneath are closer together than usual. We should not be surprised to find that these belong to a distinct species, but more materials are necessary to establish their position.

c. Wings above yellow or orange spotted with black.

10. **Charis crocea.** (Tab. XLVII. figg. 3, 4 ♂, 5 ♀.)

Charis crocea, Godm. & Salv. P. Z. S. 1878, p. 364¹.

Alis aurantio-rufis; anticis marginibus, costali et externo, posticis marginibus, externo et interno, nigro-maculatis, lineola plumbea submarginali, in anticis maculosa; subtus pallidioribus, aliter fere ut in pagina superiori.

♀ mari similis sed maculis marginalibus minoribus, area distali quoque sparsim maculata.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Volcan de Chiriqui (*Champion*), Calobre (*Arcé*¹).

This species is very like at first sight to *Cricosoma xypete*, but the presence of the plumbeous submarginal line shows its position in the genus *Charis*, an allied species being *C. perone* from the Amazons valley. Another still more closely allied species is found in Western Colombia; this we describe below as *C. occidentalis**.

Found near the margins of the forests (*Champion*).

11. **Charis holosticta.** (Tab. XLIV. fig. 7.)

Charis holosticta, Godm. & Salv. P. Z. S. 1878, p. 364¹.

Alis lemonaceo-flavis, punctis fuscis undique diffusis, lineola plumbea submarginali; subtus ut supra sed paulo dilutioribus, punctis fuscis majoribus; cruribus anticis flavis, tibiis ad finem fuscis.

* **Charis occidentalis.**

C. croceæ similis sed alarum marginibus fuscis nigro maculatis; subtus sordide griseis undique dense fusco maculatis.

♀ maculis alarum majoribus tantum differt.

Hab. Rio San Juan, Western Colombia (*Trötsch*).

Hab. GUATEMALA, San Gerónimo, Panima, San Isidro (*Champion*); NICARAGUA, Chontales (*Belt*); PANAMA, Bugaba (*Arcé*¹).

We described this species from a specimen obtained in Veraguas, but Mr. Champion has since found it in Guatemala, where he captured it at various places, especially at San Gerónimo.

It has no very near ally, but comes next to *C. crocea* and *C. peronæ* of the Amazons valley.

Found in open parts of the forest (*Champion*).

12. *Charis macularia*. (*Charis ochrias*, Tab. XLIV. fig. 8.)

Mesene macularia, Boisd. Léop. Guat. p. 22¹.

Charis ochreas, Godm. & Salv. P. Z. S. 1878, p. 365².

Alis albis flavido vix tinctis, anticis maculis quatuor costalibus, una ad angulum apicalem, duabus ad marginem externum, una ad angulum analem, duabus quoque ad marginem internum et una discali ultra cellulam, nigris; posticis maculis sex marginalibus, tribus discalibus ejusdem coloris, lineola plumbea submarginali evanescente; subtus omnino ut supra.

Hab. GUATEMALA¹; HONDURAS¹; COSTA RICA, Irazu (*Rogers*²); PANAMA, Bugaba (*Arcé*).
—COLOMBIA.

We described this species as *C. ochrias* from a specimen sent us from Costa Rica, and we have since received others. These we now find agree with the type of *Mesene macularia*, Boisdual, kindly lent us by Mons. C. Oberthür for examination. *C. macularia* is closely allied to *C. sulphurea*, but on comparing the types we noticed that the former was paler in colour, and had all the spots of the outer margin larger; there was also a spot on the inner margin which was absent in *C. sulphurea*.

13. *Charis sulphurea*.

Charis sulphurea, R. Felder, Verh. k.-k. zool.-bot. Ges. Wien, 1869, p. 469¹.

"*Ch. peronæ*, Doubl. et Hew., affinis, alis supra sulphureis maculis circiter quindecim parvis dispersis atris, plumbeo plus minus impletis, posticarum marginalibus sex minimis, linea argentea obsoleta connexis, subtus pallidioribus, maculis iisdem sed nigris, capite, palpis, pectore et pedibus cum alis concoloribus, abdomine"

Hab. MEXICO, Atayac (*Hedemann*¹).

The specimen in the Vienna Museum described above is the only one we have seen.

d. Wings above brown spotted with white.

14. *Charis pæcilopectera*. (Tab. XLIV. figg. 23, 24.)

Charis pæcilopectera, Godm. & Salv. P. Z. S. 1878, p. 365¹.

Alis griseo-brunneis, maculis sordide albescensibus dense notatis, in anticis marginem externum versus majoribus, maculis parvis externe nigris serie submarginali positis; punctis submarginalibus plumbeis vix obvis; subtus anticis sicut supra, posticis argenteo-albis irregulariter fusco maculatis.

Hab. PANAMA, Chiriqui (*Mus. Staudinger*¹).

We are indebted to Dr. Staudinger for the loan of the single specimen of this insect which we described and now figure. It is an isolated species, having no near allies that we are acquainted with.

CALYDNA.

Calydna, Westwood, Gen. Diurn. Lep. p. 436 (1851).

Calydna comprises about thirty species, ranging from Mexico to South-east Brazil; three only come within our limits, and all occur in Mexico.

The subcostal branch of the primaries in *C. hegas* emits two branches before the end of the cell and one after it; both the lower and middle discocellulars are atrophied, the latter meets the upper radial a little beyond its junction with the subcostal, so that there is a very short upper discocellular, the former meets the median some way beyond the second branch; the costal and median sides of the cell are very nearly equal. The secondaries have a basal nervure; the discocellulars are atrophied, the upper meets the subcostal beyond the first branch, the lower the median beyond the second branch; the costal side of the cell is about equal to the median side.

The front legs of the male are slender, they have the trochanter inserted beyond the middle of the coxa, femur $> \frac{1}{2}$ coxa, tibia $<$ coxa, tarsus=femur; the terminal tarsal joint of the front leg of the female=second joint, and has a setose pad beneath, the first, second, third, and fourth joints each terminate beneath with a pair of strong spines. The palpi have a slender terminal joint= $\frac{1}{3}$ middle joint; the antennæ have thirty-two joints, the terminal twelve forming a well-defined club.

The harpagones in the secondary sexual organs of the male are subtriangular; the outer edge curves outwards about the middle, and recedes again before the apex, which, as well as the outer margin, is setose. The penis is a simple rod, with the usual curved strap running from its middle to the base of the harpagones. The bursa copulatrix of the female has two well-defined chitinous spines with granular surfaces.

1. *Calydna venusta*, sp. n. (Tab. XLVII. figg. 1, 2.)

Alis obscure fuscis, maculis nigris brunneo marginatis notatis, lineola submarginali lunulata albida, extra eam maculis nigris in serie positis, anticis macula subtriangulari ad cellulæ finem, duabus minoribus extra eam, altera juxta costam, semihyalinis; subtus pallidioribus maculis omnibus multo magis distinctis, cilia alterne fusca et alba.

♀ alis brunnescientioribus, aliter mari sat similis.

Hab. MEXICO, Acapulco (*J. J. Walker*); NICARAGUA, Chontales (*Belt*).

We have two specimens of this species, one a male in beautiful condition, which was captured by Mr. Walker near Acapulco and kindly presented to us; the other, from Nicaragua, is apparently a female, but much worn.

We do not know that it has any near ally.

BIOL. CENTR.-AMER., Rhopal., Vol. I., January 1886.

2. *Calydna hegas*.

Calydna hegas, R. Feld. Verh. k.-k. zool.-bot. Ges. Wien, 1869, p. 468¹.

Alis anthracinis, anticis macula ad cellulæ finem tetragona, punctoque supra eam semihyalinis, posticis macula fasciæformi per cellulæ finem irregulariter excisa ejusdem coloris, ciliis albis nigro intermixtis, lineola tenuissima submarginali cana, extra eam atomis variis ejusdem coloris, posticarum costa bitrionte basali ferruginea; subtus dilutioribus maculis nigris bene notatis, maculis semihyalinis sicut supra.

♀ alis fuscis, maculis nigrescentibus fulvo marginatis undique notatis, maculis semihyalinis sicut in mare sed multo minoribus; subtus ut supra.

Hab. MEXICO, Cordova (*Rümeli*), Oaxaca (*Fenochio*), Yucatan (*Hedemann*¹), Valladolid in Yucatan (*Gaumer*); GUATEMALA, Vera Paz (*Hague*), San Gerónimo, Cubulco (*Champion*); PANAMA, Volcan de Chiriqui (*Champion*).

Rudolph Felder described this species from Yucatan specimens¹, whence we also have an example which agrees with others from Mexico, and a large series of both sexes from Guatemala, where Mr. Champion found it in abundance in the second-growth woods on the slopes of the hills near San Gerónimo. We have little doubt that we have rightly named our specimens. The only point of discrepancy is as regards size. Felder says that *C. hegas* is a little larger than *C. hiria*; but our specimens are decidedly smaller. *C. hiria*, however, is not the species most nearly allied to that we are now considering, for it can with difficulty be distinguished from *C. sternula* as we understand that species; in the latter, however, there is a small spot in the cell of the primaries, and two others on the outer half of the costa. This is but a slight difference, but constant so far as we can see.

3. *Calydna sinuata*.

Calydna sinuata, R. Feld. Verh. k.-k. zool.-bot. Ges. Wien, 1869, p. 468¹.

"Præcedenti (*C. hegas*) affinis, sed tertia parte fere minor, alis anticis apice subfalcato, margine externo denticulato, medio convexo, posticis inter venam subcostalem et ramum medianum tertium sat profunde sinuatis, denticulatis, supra omnibus obscure cinereis, ciliis sordide albescenti intersectis, striga anteciliari, fasciis basalibus, fascia discali flexuosa alteraque submarginali maculari extus lineolis albo-cinereis cinctis nigricantibus, atomis albo-cinereis limitatis, anticarum macula ad cellulæ extimum, punctis duobus supra unoque pone eam et quarto supra venam internam, posticarum macula fasciæformi lacerata ante medium hyalinis, atro marginatis, subtus omnibus pallidioribus, maculis et fasciis multo saturatioribus."

Hab. MEXICO, Atayac (*Hedemann*¹).

We have never seen specimens of this species.

SAROTA.

Helicopsis, Sect. 2 (*Sarota*), Westwood, Gen. Diurn. Lep. p. 424 (1851).

We recognize two sections of this genus, one represented by *S. chrysus*, a species of wide range, as will be seen below; the other by *S. gyas*. The position of the former species has long been a matter of doubt; it was originally placed by Westwood in a section of *Helicopsis*, whence it was removed to *Anteros* by Mr. Bates. The densely hairy character of the front legs of the males of all the species of these two genera has

suggested these alliances, but on further dissection the separation of *Sarota* into a distinct genus seems unavoidable. Not only do the wings differ in neuration, but the spiny tarsus, in addition to its hairiness, as well as the difference in the sexual characters of the male, all indicate generic distinction. The subcostal nervure of the primaries emits two branches before the end of the cell and one after it; the lower and middle discocellulars are almost if not quite atrophied; there is a short upper discocellular directed outwards. The secondaries have a basal nervure, the discocellulars are completely atrophied, a small spur beyond the first branch of the subcostal marks the position of the upper discocellular; a similar spur on the median beyond the second branch marks the position of the lower discocellular; the first median branch and the median itself are both elongated and carry lobes beyond the general contour of the outer margin; the anal angle is produced and carries a long fringe.

The front legs of the male have the trochanter inserted a little beyond the middle of a short slender coxa, femur $=\frac{2}{3}$ coxa and is slightly dilated towards its distal end, tibia $=$ coxa dilated in the middle, tarsus $<$ tibia densely spined beneath, and with two constrictions, the remains of former joints. Palpi have a slender terminal joint $=\frac{1}{3}$ middle joint. Antennæ have thirty-six joints, whereof the terminal fourteen form a moderate club. The eyes are smooth.

The harpagones have two lobes, the lower one short and pointed, the upper one elongated and blunt, both densely setose. There is a short slightly depressed hook between the lobes of the tegumen; the penis is exceedingly long, reaching backwards to the third segment of the body, where it passes the sixth segment there is a short patch of dentate papillæ, it bends downwards towards its extremity, and there is the usual strap connecting it with the harpagones.

In *S. gyas* the neuration of the primaries is very similar to that of *S. chrysus*; it also has a short upper discocellular; the secondaries are without the prolongation of the median nervure and its first branch. The tarsus of the front legs of the male has a few spines beneath, which appear to be arranged in pairs, indicating the position of former joints.

The secondary male organs are very similar in both species, the penis being shorter in *A. gyas*. The female of this latter species has two well-defined flattened chitinous spines in the bursa copulatrix.

a. Median nervure of the secondaries and its first branch much produced beyond the margin of the wing.

1. *Sarota chrysus*.

Papilio chrysus, Cram. Pap. Exot. t. 380. D, E¹.

Anteros chrysus, Bates, Journ. Linn. Soc. Zool. ix. p. 435².

Helicopsis (Sarota) dematria, Doubl. & Hew. Gen. Diurn. Lep. t. 71. f. 10³.

Anteros dematria, Bates, Journ. Linn. Soc. Zool. ix. p. 435⁴.

Alis nigricanti-fuscis, anticis ad basin, posticis præter marginem externum pallidioribus, anticis macula ad

cellulæ finem, altera inter ramos medianos et tribus subapicalibus albis, posticis maculis tribus indistinctis inter venam medianam et angulum analem nigricantibus, vix albido circumcinctis; subtus gilvis maculis albis, nigris, castaneis, et metallicis undique marmoratis, posticis vena mediana et ramis suis productis ad finem distincte ciliatis, angulo anali quoque producto et ciliato; cruribus fulvis.

♀ subtus pallidior, anticis ad basin et posticis sordide cinerescens, anticis macula altera alba inter ramum primum et submedianum.

Hab. GUATEMALA, Chisoy valley (*Hague*); San Gerónimo, San Isidro, Panima (*Champion*); HONDURAS^{3 4}; NICARAGUA, Chontales (*Belt*); PANAMA, Bugaba, Calobre (*Arceé*).—COLOMBIA; AMAZONS²; GUIANA¹.

Guatemala specimens of this species are darker beneath than those from the State of Panama; this is due to the black markings being slightly larger, at the expense of the chestnut marks surrounding them. Examples from the Lower Amazons are somewhat intermediate in this respect, and we find it inexpedient to attempt any separation, no points of apparent difference forming tangible characters. The range, too, of the species as a whole seems uninterrupted from Guatemala to the Amazons valley.

Frequents second-growth woods (*Champion*).

b. Secondaries rounded or uniformly serrate.

2. *Sarota gyas*.

Papilio gyas, Cram. Pap. Exot. t. 28. ff. F, G¹.

Alis fusco-nigricantibus unicoloribus, marginibus externis integris, ciliis omnino fuscis; subtus rubidis, marginibus externis fulvis, linea nigra, deinde altera metallica, intus limbatis; anticis linea metallica margini externo parallela a vena mediana ad marginem internum extensa, intra eam plaga irregulari nigra, linea metallica subcostali partim interrupta, altera infra eam ad angulum apicalem, maculis duabus nigris, una ad cellulæ finem, altera infra eam; posticis plaga magna ad cellulæ finem, altera ultra eam, nigris, ultra et intra et lineis variis metallicis; cruribus sordide fulvo-albidis.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Bugaba (*Champion*), Lion Hill (*McLeannan*).—SOUTH AMERICA from Colombia and Guiana¹ to Brazil.

This species has been associated with *A. acantus* of Cramer, to which no doubt it bears a very strong resemblance; but the anterior legs are pale fulvous, whereas in *A. acantus* they are black. The two lines parallel to the costa near the apex of the primaries in *S. gyas* are not seen in the allied species; the line parallel to the outer margin, which in *S. gyas* terminates at the median nervure, is carried forward almost to the costa.

Mr. Belt procured several specimens of this species; but unfortunately all more or less in a bad condition.

3. *Sarota gamelia*, sp. n.

A. gyadi similis, cruribus eodem modo pictis, subtus anticis maculis submarginalibus elongatis, serie positis, haud linea conjunctis, costa ipsa metallica, haud fulva, et maculis multis disjunctis nigris castaneo circumcinctis, angulo anali magis producto et ciliis posticarum leviter sinuatis.

Hab. GUATEMALA, Choctum (*Hague*), Sinanja (*Champion*); NICARAGUA, Chontales (*Belt*); PANAMA, Bugaba, Volcan de Chiriqui (*Champion*).

This species, so like its allies on the upper side, and resembling *S. gyas* in the colour of its legs, may readily be distinguished by the submarginal elongate spots on the primaries beneath, which it alone possesses. The metallic costal border connects it with *S. myrtea* and *A. acantus*, both of which, however, have the front legs black. Both our Guatemala specimens are females and are of large size; they do not, however, differ essentially from those taken by Mr. Champion in the State of Panama, where he found them in open places in the second-growth woods, sometimes about flowers.

4. *Sarota myrtea*, sp. n.

A. gyadi similis sed cruribus anticis fusco-nigris (haud fulvo-albidis) distinguendus. Alis subtus multo obscurioribus et maculis nigris castaneo circumdati, anticis costa ipsa metallica.

Hab. GUATEMALA, Cubilguitz (*Champion*); NICARAGUA, Chontales (*Belt*).

In the colour of its legs this species comes close to *S. acantus*, but there are differences in the markings of the under side: the second submarginal metallic band in *S. acantus*, as we have already said, extends very nearly to the costa; in the allied species it stops short at the median nervure, and beyond towards the apex are two metallic bands running parallel to the costa, the costa itself being metallic, whereas in *A. acantus* it is chestnut; in *S. myrtea*, also, the black markings are more broken up into spots, and are surrounded with chestnut.

We have only three specimens, all males from the above localities.

5. *Sarota psaros*, sp. n. (*Anteros psaros*, Tab. XLIII. figg. 14, 15.)

Supra alis nigricante-brunneis, macula ad cellulæ finem indistincte nigra; posticis maculis tribus submarginalibus ad angulum analem nigricantibus, atomis nonnullis ad angulum eundem fulvis, ciliis alterne fuscis et albis, ad fines ramorum posticarum valde productis; anticis margine externo medialiter productis, subtus niveis fusco et fulvo sparsim atomatis, ad basin castaneis nigro maculatis lineisque variis metallicis notatis; marginibus externis castaneis, lineis submarginalibus duabus, exteriore nigra, interiore metallica, et maculis submarginalibus eodem modo pictis; anticis ultra cellulam castaneis, nigro et colore metallico punctatis; cruribus niveis.

♂ adhuc ignotus.

Hab. GUATEMALA, Cahabon (*Champion*).

Mr. Champion obtained a single female specimen of this beautiful species at Cahabon. It is quite unlike any other *Sarota*, the colouring of the under side being very peculiar. The serrate margin of the hind wings suggests an affinity with *S. acanthoides*.

ANTEROS.

Anteros, Hübner, Verz. bek. Schmett. p. 77 (1816); Westwood, Diurn. Lep. p. 427 (1851).

We recognize thirteen species of this genus as at present restricted, that is excluding the members of the genus *Sarota*, which have hitherto been included in it. Six of

these occur within our limits, of which *A. carausius* is spread over the whole of our region; the others belong chiefly to more southern parts, though *A. roratus* occurs in Guatemala.

The primaries of *A. formosus* differ from those of *A. chrysus* in having practically no upper discocellular, though in *A. carausius* there is a very short one; and the front legs of the male of *A. formosus* have no tarsal spines as in the allied genus. The legs are hairy. The tegumen of the male sexual organs in *A. formosus* has a very short central spine between the lateral lobes; the harpagones have two long rods, both of them dentate along their upper edge, and setose towards their extremity, the upper lobe has also a single dentate process beyond the middle; the penis is straight for half its length, then curves upwards and finally downwards, there is the usual strap from its centre to the base of the harpagones. These organs in *A. carausius* differ in the form of the harpagones, the upper rod is flattened and widened out towards its extremity, where it is strongly setose on its outer surface as well as along its upper edge, the lower rod is much shorter, with a few hairs at its extremity.

a. Wings beneath yellowish white, with jewelled spots.

1. *Anteros cupris*.

Anteros cupris, Hew. Ex. Butt., Erycinidæ, f. 4, 5¹.

Alis fuscis, anticis macula magna subtriangulari infra cellulam lactea; subtus lacteis, maculis saturate castaneis punctis metallicis notatis undique diffusis, posticis costa lactea.

♀ mari similis macula anticarum permagna; posticis præter arcum costalem et lineam submarginalem lacteis.

Hab. PANAMA, Chiriqui (*Ribbe*), Bugaba (*Champion*).—COLOMBIA; VENEZUELA¹.

This is the northern form of *A. achæus* of Guiana and the valley of the Amazons, and certainly very closely allied to it. The milky spot on the primaries is considerably larger, and the secondaries have nearly the whole of the outer portion of that colour; the chestnut spots beneath are not quite so dark in colour, and the metallic spots inside them are of less extent. It was described by Hewitson from specimens said to come from Venezuela.

Found on the margins of the forest of the low country (*Champion*).

2. *Anteros formosus*.

Papilio formosus, Cram. Pap. Ex. t. 118. f. G¹.

Anteros formosus, Bates, Journ. Linn. Soc. Zool. ix. p. 435².

Papilio cræsus, Fabr. Sp. Ins. ii. p. 117³.

Papilio valens, Fabr. Mant. Ins. ii. p. 67⁴.

Anteros micon, Druce, Cist. Ent. i. p. 360⁵.

Alis fuscis, macula rotunda et posticarum costa lacteis; subtus ochraceo-lacteis maculis castaneis metallicis gemmatis, linea submarginali aurea, intra eam altera castaneo-atomata.

♀ mari similis.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Chiriqui (*Ribbe*), Bugaba (*Champion*), Calobre (*Arcé*).—VENEZUELA; AMAZONS VALLEY²; GUIANA².

With Mr. Druce's type of *A. micon* before us we are unable to distinguish any differences whereby to separate it from *A. formosus*, which seems to enjoy an uninterrupted range from Nicaragua to the mouth of the Amazons and Guiana. Its relationship is evidently with *A. cupris* and *A. achæus*; but it is a very much smaller insect, and has characters of its own.

3. *Anteros allectus*.

Anteros allectus, Westw. in Doubl. & Hew. Gen. Diurn. Lep. p. 428¹; Hew. Ex. Butt., *Anteros*, ff. 5, 6²; Bates, Journ. Linn. Soc. Zool. ix. p. 436³.

Alis fuscis, posticis margine costali lacteo; subtus lacteis medialiter ochraceis, viridi-argenteo sparsim gemmatis, ciliis albis, ad fines venarum fuscis.

♀ mari similis, anticis medialiter uni- aut bi-maculatis.

Hab. PANAMA, Volcan de Chiriqui, Bugaba (*Champion*).—UPPER AMAZONS³.

We have several specimens of this pretty species from the State of Panama, which agree closely with those captured by Mr. Bates at Ega on the Amazons. The ochreous patch in the middle of the wings is hardly so dark as in the southern form, and the spots on the primaries of the female are, as a rule, larger; but neither of these characters is sufficiently stable to justify a separation of the Central American and the Amazon insects.

This is the only Central American *Anteros* with which we are acquainted which has no submarginal line beneath.

Found on the forest margins, where once or twice pairs were beaten out on to the net in copulâ (*Champion*).

4. *Anteros roratus*, sp. n.

Alis fuscis, anticis immaculatis, posticis margine costali lacteo; subtus lacteis, medialiter ochraceis, cellulis et ultra eas frequenter maculis parvis viridi-argenteis gemmatis, linea maculosa submarginali ejusdem coloris.

♀ anticis macula elliptica in medio notatis, posticis dimidio distali plerumque lacteis venis fuscis divisis.

Hab. GUATEMALA, Cahabon (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA, Cache (*Rogers*); PANAMA, Bugaba, Volcan de Chiriqui (*Ribbe*, *Champion*).

This is a race of *A. chrysoprasta*, differing in the males having no milky spot on the primaries above; the females, for the most part, but not always, have the distal half of the secondaries of this light colour.

A. roratus seems to be a common species in Chiriqui, whence we have a series of examples, but rarer farther north, there being but a single specimen in Belt's collection, and only one was captured by Mr. Champion in Guatemala.

Found in sunny openings on the margins of the forest. This, like other species of

the genus, rests beneath leaves, the wings extended horizontally; if disturbed, it immediately flies to another leaf (*Champion*).

b. Wings beneath mottled.

5. *Anteros carausius*.

Anteros carausius, Westw. in Doubl. & Hew. Gen. Diurn. Lep. p. 428¹; Hew. Ex. Butt., *Anteros*, i. ff. 3, 4²; Bates, Journ. Linn. Soc. Zool. ix. p. 435³.

Anteros medusa, Druce, Trans. Ent. Soc. 1874, p. 160⁴.

Alis nigricantibus, anticis ad basin, posticis fere omnino glauco-cærulescentibus, macula hyalina obliqua ad cellulæ anticarum finem, altera juxta eam inter ramos medianos; subtus ochraceis, castaneo plus minusve irroratis, anticis maculis hyalinis ut in pagina superiori, striis variis ad basin metallico-lineatis læte castaneis, in posticas transeuntibus (nonnunquam interruptis), linea submarginali communi ejusdem coloris utrinque metallico limbata, margine ipso alterne castaneo maculato; cruribus saturate castaneis.

Hab. MEXICO^{1 3} (*Sallé*), Presidio (*Forrer*), Valladolid in Yucatan (*Gaumer*); GUATEMALA, Polochic valley (*Hague*), Cahabon, San Gerónimo (*Champion*); NICARAGUA, Chontales (*Belt*); PANAMA⁴, Bugaba, Taboga Island (*Champion*), Calobre (*Arcé*).

Professor Westwood based this name upon Mexican specimens, in which country this species has a wide range, and whence we trace it throughout Central America to our southern limits. In the State of Panama we meet with examples in which the markings of the under side are less varied; the apex of the primaries and the discal area of the secondaries are uniformly mottled with ochre and chestnut, the latter being destitute of black spots. Upon one such specimen Mr. Druce based the name *A. medusa*, but we find examples of the Mexican type also in Panama, with intermediate examples connecting the two forms; we therefore place them all under the name *A. carausius*.

Found in open places about flowering bushes (*Champion*).

6. *Anteros renaldus*. (Tab. XLII. figg. 6, 7.)

Papilio renaldus, Stoll, Suppl. Cram. Pap. Ex. t. 13. ff. 1, 1 a¹; Westw. Gen. Diurn. Lep. t. 70. f. 6²; Bates, Journ. Linn. Soc. Zool. ix. p. 435³.

Alis nigricantibus anticarum dimidio interno et posticis fere omnino cæruleis certa luce rosacco nitentibus; maculis duabus hyalinis, una ad cellulæ finem, altera infra eam inter ramos medianos; subtus sordidis fusco-nebulosis, maculis hyalinis ut supra, vitta obliqua posticarum basi transeunte ad medium anticarum cellulæ acute terminata; posticis maculis variis discalibus sordide metallicis, linea communi submarginali flavida intus metallica; fronte, palpis, cruribus et margine posticarum hirsuto, rosacis.

Hab. NICARAGUA, Chontales (*Belt*).—COLOMBIA; LOWER AMAZONS³; GUIANA³.

There can be but little doubt that this species is that described by Stoll under the specific name of *renaldus*. Although the figure he gives of it is not very accurate, still we recognize it by the colour of the upper side and the rosy tint of the legs, the latter a most trustworthy character. It is somewhat strange that Nicaragua alone in Central America has produced us specimens of this species, but we have it from just over our border in Western Colombia.

EMESIS.

Emesis, Illiger, Mag. vi. p. 287 (1807); Westwood, Gen. Diurn. Lep. p. 446 (1851).

About thirty species are contained in this genus, ranging from Mexico to South Brazil; fourteen are found within our area, two of which cross the frontier northwards into the State of Arizona. Their numbers are pretty evenly distributed from South Mexico to Panama.

The subcostal nervure of the primaries of the male in *E. lucinda* emits two branches before the end of the cell and one after; both discocellulars are atrophied, the middle meets the subcostal at the same point as the upper radial, the lower the median a little beyond the second branch; the costal and median sides of the cell are subequal. The secondaries have a strong basal nervure; both discocellulars are atrophied, the upper meets the subcostal beyond the first branch, the lower the median beyond the second branch; the costal side of the cell is shorter than the median side.

The front legs of the male have the trochanter inserted beyond the middle of the costa; femur = $\frac{1}{2}$ coxa; tibia = $\frac{3}{4}$ coxa; tarsus (four-jointed) > tibia, first joint longer than the other three together; there is a spine near the end of the tibia, and a long and a short one at the end of the terminal tarsal joint. The terminal tarsal joint in the front leg of the female is as long as the two preceding, and has a setose pad beneath; the first four joints terminate in a pair of strong spines, and there are shorter spines beneath on the first and second joints. The palpi have a short slender terminal joint = $\frac{1}{4}$ middle joint, which is stout and of uniform width throughout. The antennæ have thirty-six joints, whereof the terminal thirteen form a moderate club.

The harpagones in the male secondary sexual organs have two short rounded lobes, setose at their extremity; these are connected by a piece forming an arch over the penis. The penis itself is long, and near its middle consists of a number of trachia-like rings, inside of which is a strong spine directed outwards; beyond this structure the usual strap proceeds forwards, and bends round to the base of the harpagones. The bursa copulatrix of the female has two very short blunt prominences, of smooth texture, and without granulations.

In *E. æthalia* the neuration of the wings is similar to that of *E. lucinda*, and in this respect the secondaries of *E. tenedia*, *E. fatimella*, and *E. zela* all agree. The front legs of the males of all these species agree in being four-jointed; but in the front leg of the female of *E. æthalia* the third joint of the tarsus is longer than the terminal joint, is much dilated, and has a large setose pad on its under surface. The general structure of the secondary sexual organs of the male in the four species above named is very similar, small differences in the development of the lobes of the harpagones being alone traceable. In the penis of *E. fatimella* we can discern the trachea-like rings present in *E. lucinda*; in the other species the penis is simple, but

the internal spine is present in the other species, except perhaps in *E. zela*. Spinous processes are present in the bursa copulatrix of all the above species except *E. tenedia*, which we have not examined; they are long and well developed in *E. zela* and *E. fatimella*, especially in the latter; in *E. æthalia* they are reduced to granular patches.

α. Sexes similar.

α'. Males without a yellow band on the primaries.

1. *Emesis æthalia*. (Tab. XLII. figg. 16, 17 ♂, 18 ♀.)

Emesis æthalia, Bates, Journ. Linn. Soc. Zool. ix. pp. 385, 437¹.

Emesis olivæ, Butl. & Druce, Cist. Ent. i. p. 103²; P. Z. S. 1874, p. 353³.

Polystichtis ocypore, Geyer in Hübn. Zutr. ex. Schmett. v. f. 989, 990⁴?

Alis fuliginoso-fuscis, supra lineolis fuscis transvittatis, una vitta prope cellulam et duabus submarginalibus; subtus ut supra sed alis dilutioribus.

♀ alis multo pallidioribus fasciis omnibus distinctis.

Hab. GUATEMALA, Panzos (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*^{2 3}); PANAMA, Chiriqui (*Zahn*), Bugaba (*Champion*), Calobre (*Arcé*).—COLOMBIA¹; ECUADOR; AMAZONS.

Mr. Bates described this species from specimens collected at Santa Marta, Colombia, by the late M. Bouchard¹. It has since been traced to Pebas and other places in the Amazons valley, and northwards in our country to Guatemala. It is, however, much more common in Nicaragua and places lying to the south of it than in Guatemala, whence we have but a single specimen.

With the types of *E. æthalia* and of *E. olivæ*, of Messrs. Butler & Druce, before us, we have no hesitation in referring these two names to one species.

2. *Emesis fatimella*.

Emesis fatimella, Westw. in Doubl. & Hew. Gen. Diurn. Lep. p. 447¹; Bates, Journ. Linn. Soc. Zool. ix. p. 437².

Papilio fatima, Cram. Pap. Ex. t. 271. C, D (nec A, B)³.

Alis ochraceo-ferrugineis undique nigro irregulariter lineolatis, punctisque submarginalibus notatis; subtus supra.

♀ mari similis sed alis magis ochraceis.

Hab. PANAMA, David (*Champion*), Veraguas (*Arcé*).—SOUTH AMERICA, Colombia² to Brazil¹, and Amazons valley¹.

Specimens from the Amazons region are not quite so clearly spotted as those from our country and from Brazil; but we think there can be no question as to the identity of the species.

E. fatimella appears to be rare in Central America, as we have only two specimens from the State of Panama. In the south it is more common. It is the brightest species of *Emesis* in our country, and distinguished by the clear ferruginous colour of its wings.

3. *Emesis mandana*.

Papilio mandana, Cram. Pap. Ex. t. 271. E, F¹.

Emesis mandana, Bates, Journ. Linn. Soc. Zool. ix. p. 436².

Nelone mandana, Boisd. Léop. Guat. p. 24³.

Erycina ops, Latr. in Humb. & Bonpl. Obs. Zool. ii. p. 89, t. 37. ff. 3, 4⁴.

Nelone ops, Boisd. Léop. Guat. p. 23⁵.

Emesis furor, Butl. & Druce, Cist. Ent. i. p. 104⁶; P. Z. S. 1874, p. 353⁷.

Alis rufo-brunneis transversim obscure-fusco lineolatis, punctis submarginalibus nigricantibus; subtus læte ochraceo-ferrugineis nigricanti-brunneo sicut supra magis distincte notatis.

♀ mari similis sed alis sordidioribus.

Hab. MEXICO, Cordova (*Rümeli*), Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA³, Polochic valley, San Gerónimo (*F. D. G. & O. S.*, *Champion*); HONDURAS^{5 6}; COSTA RICA⁵ (*Van Patten*^{6 7}), Irazu (*Rogers*); PANAMA, David (*Champion*)—SOUTH AMERICA, Colombia² to Paraguay, Amazons², and Guiana^{1 2}.

As may be seen above, this species ranges over the whole of Tropical America, and, as might be expected, shows some variation within the limits of this wide area. We do not, however, see characters sufficiently strong in any one district to enable us to divide the species. Moreover, Mexican and South-Brazilian specimens are almost absolutely alike.

Found in thinly-wooded districts (*Champion*).

4. *Emesis tenedia*. (Tab. XLIII. figg. 16, 17 ♂, 18 ♀.)

Emesis tenedia, Feld. Wien. ent. Monatschr. v. p. 99¹; Bates, Journ. Linn. Soc. Zool. ix. p. 436²; Butl. & Druce, P. Z. S. 1874, p. 353³.

Alis fuscis, lineis sinuosis obscuris transfasciatis; subtus fusco-rufescentibus lineis interruptis nigris transvittatis, ad margines externos punctulatis.

♀ alis pallidioribus lineis transversis magis obviis, anticis fascia transversa irregulari ultra cellulam plus minusve distincta fulva; subtus fulvis, punctis nigricantibus ad margines externos distincte notatis.

Hab. MEXICO, Cordova (*Rümeli*), Valladolid in Yucatan (*Gaumer*); GUATEMALA², Dueñas, Polochic valley, Chisoy valley, Choctum (*F. D. G. & O. S.*), Guatemala City Dueñas, Cubulco, San Gerónimo, San Juan in Vera Paz, Senahu, Panima, Cahabon (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); COSTA RICA (*Van Patten*³), Rio Sucio, Cache, Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Zahn, Arcé, Champion*), Bugaba (*Champion*), Calobre (*Arcé*).—COLOMBIA^{1 2}; VENEZUELA¹.

This is the commonest species of *Emesis* in Central America, being especially abundant in Guatemala, where it is found from nearly the sea-level to an elevation of about 5000 feet. It frequents the second-growth woods and the margins of the forest. The males of *E. tenedia* are very constant in their colour, but the females vary in the extent and colour of the cross-band of the primaries, which is in some examples almost a dirty white, and in others it approaches the colour of the rest of the wing, so as to be not very distinct. These differences in the female are found, so far as we can see, nearly

everywhere throughout the range of the species, but the darker individuals are prevalent in Mexico and in the south, the light-banded ones predominating in the intermediate countries, especially in Costa Rica.

E. tenedia was based upon Venezuelan examples¹ which are now in our possession.

5. ***Emesis vulpina***, sp. nov.

E. tenediae similis sed alis supra multo rufescentioribus vix lineolatis; subtus quoque pallidioribus fere ochraceis lineolis subobsoletis.

♀ nobis ignota.

Hab. MEXICO, Presidio near Mazatlan (*Forrer*).

Mr. Forrer procured us three specimens in this locality, which, so far as we know, is considerably outside the range of *E. tenedia*.

E. vulpina almost approaches *E. fatimella* in the colour of its wings, but is still duller than that species.

6. ***Emesis lupina***, sp. nov. (Tab. XLII. figg. 13, 14 ♂, 15 ♀.)

E. tenediae similis sed alis multo grisescentioribus lineolis paginae superioris magis obviis; subtus pallidioribus, lineolis plerumque evanescentibus.

Hab. HONDURAS, San Pedro (*G. M. Whitely*); NICARAGUA, Chontales (*Belt*); COSTA RICA, Irazu, San Francisco (*Rogers*).

The greyer colour of the wings of this *Emesis* seems to be its chief characteristic whereby to distinguish it from *E. tenedia*. This also affects the female as well as the male. Most of our specimens are from Costa Rica, where Rogers obtained a good many examples.

7. ***Emesis tegula***, sp. nov.

E. tenediae quoque similis sed alis fulvescentioribus lineolis paginae superioris magis distinctis; subtus ferrugineis rufo lineolatis, posticis punctis submarginalibus fuscis notatis.

♀ alis omnino pallidioribus lineolis alarum supra et subtus magis conspicuis.

Hab. MEXICO, Valladolid in Yucatan (*Gaumer*); GUATEMALA, Zapote (*Champion*); NICARAGUA (*Bridges*); PANAMA, Calobre (*Arcé*), Lion Hill (*M'Leannan*).

Though we have compared this species with *E. tenedia*, its nearer allies are *E. aurelia*, of North Brazil, and *E. diogenia*, of Rio Janeiro and its neighbourhood. In both these species the submarginal spots of the secondaries beneath are well developed. They are just indicated in *E. tegula*, more so in the female than in the male.

E. tegula is a rare species to us, and the above-mentioned localities are each represented in our collection by only a specimen or two.

8. ***Emesis zela***.

Emesis zela, Butl. Ann. & Mag. N. H. ser. 4, v. p. 364¹; Lep. Ex. t. 14. f. 7².

Lemonias ares, W. H. Edw. Papilio, ii. p. 136³.

Alis fuscis, transversim obscure fusco lineolatis, anticis plaga ultra cellulam subquadrata ejusdem coloris costam

attingente, posticarum dimidio costali (præter marginem externum) fulvo-nigro maculato, punctis submarginalibus fuscis; subtus ferrugineis maculis evanescentibus fulvis, anticarum dimidio interno nigro maculato.

♀ alis ferrugineo-fuscis undique fusco-nigro notatis; subtus ochraceo-fulvis, aliter sicut in mare.

Hab. NORTH AMERICA, Arizona³.—MEXICO^{1 2}, Northern Sonora (*Morrison*), Orizaba (*Sallé*), Oaxaca (*Fenochio*).—VENEZUELA ??^{1 2}.

Mr. Butler's types of this species agree with our specimens from Southern Mexico and with a large series from Arizona, or from the country lying immediately to the south of it; and we altogether doubt the correctness of their reputed locality, Venezuela. In Mr. Morrison's series, representing the *Lemonias aries* of Edwards, we notice some variation, especially in the distribution of the tawny portions of the secondaries, which in some examples pervades the whole wing, instead of only the costal portion of it.

9. *Emesis cleis*.

Lemonias cleis, W. H. Edw. Papilio, ii. p. 137¹.

E. zela similis, sed alis magis distincte maculatis, anticis punctis submarginalibus distincte notatis, plaga ultracellulari nulla.

♀ a femina *E. zela* eodem modo differt.

Hab. NORTH AMERICA, Arizona¹.—MEXICO, Northern Sonora (*Morrison*).

This species has a more restricted range than *E. zela*, and has as yet been found only on our northern boundary and in Arizona. It was one of Mr. Morrison's discoveries, from whom alone we have received specimens.

α''. Both sexes with a yellow band on the primaries.

10. *Emesis lacrimæ*.

Emesis lacrimæ, Hew. Ent. Monthl. Mag. vii p. 5¹; Ex. Butt., *Emesis*, i. f. 2².

Alis rufis dimidio basali lineis nigris transfasciatis et punctis submarginalibus notatis, anticis fascia ultracellulari fulva; subtus brunneo-fulvis ad basin griseiscentibus, maculis paginæ superioris latioribus et valde distinctis.

♀ mari similis, sed alis pallidioribus et magis distincte notatis, fascia anticarum ultracellulari ochracea.

Hab. NICARAGUA, Chontales (*Belt*^{1 2}).

This beautiful and distinct species has hitherto only been found in Nicaragua, where it was procured by Belt. In size it fully equals *E. mandana*, a species it may possibly take the place of in Nicaragua, as hitherto we have not seen the latter from that country.

11. *Emesis cypria*.

Emesis cypria, Feld. Wien. ent. Monatschr. v. p. 99¹; Reise d. Nov. Lep. p. 293, t. 36. ff. 12, 13²; Bates, Journ. Linn. Soc. Zool. ix. p. 436³.

Alis supra rufescenti-fuscis, anticis ultra cellulam fascia fulva bisectis, posticis fasciis evanescentibus margini interno plus minusve parallelis pallido fuscis; subtus saturate ferrugineis ad basin fusco transvittatis, fascia anticarum ut supra, posticis lineis tribus submarginalibus notatis.

♀ mari similis, sed posticarum fasciis magis distinctis.

Hab. COSTA RICA (*Van Patten*), Cache, Irazu (*Rogers*); PANAMA, Volcan de Chiriqui (*Champion*), Calobre (*Arcé*).—COLOMBIA³; VENEZUELA^{1 3}; ECUADOR; BOLIVIA.

Described from Venezuela, this distinct species has been traced to Bolivia in the south and to Costa Rica in the north, being everywhere, judging from the number of the specimens that have reached us, by no means uncommon.

The fulvous stripe which crosses the primaries in this species renders it easily distinguishable from all other Central American members of this genus.

It inhabits second-growth woods and forest margins (*Champion*).

12. *Emesis paphia*.

Emesis paphia, R. Feld. Verh. z.-b. Ges. Wien, 1869, p. 467¹.

"*E. cyprice*, Feld., accedens, sed minor, alis brevioribus supra fuscis, strigulis basalibus diffusis obsoletissimis, posticarumque strigis duabus subrectis pone medium et maculis obsoletis seriatis submarginalibus obscurioribus, anticis utrinque fascia latiuscula æquali, obliqua, ochraceo-fulvescente, subtus ferrugineo-fuscis, fascia eadem sed latiore, basi grisescenti atomosa et obsolete fusco punctata, posticis ibidem dilutioribus quam supra, venis ultra medium, basi et margine interno grisescenti atomosis, punctis basalibus obsoletis nigricantibus, strigis duabus supernis magis tamen diffusis maculisque submarginalibus valde obsoletis, introrsum aliis sublinearibus ochraceo-canis atomariis, apud plicas insidentibus, palpis frontem haud attingentibus et pedibus ochraceis, pectore et ventre pallide grisescantibus."—*Felder ut supra*.

Hab. MEXICO, Atayac (*Hedemann*¹).

Described from a female specimen which we have not been able to recognize.

b. Sexes dissimilar.

13. *Emesis aurimna*.

Nelone aurimna, Boisd. Lép. Guat. p. 24¹.

Emesis fastidiosa, var., Hew. Ex. Butt., *Emesis*, f. 8².

Alis glauco-cinereis dimidio basali lineolis fuscis transfasciatis; fasciis duabus margini externo subparallelis ejusdem coloris, anticis ad apicem pallidioribus et immaculatis; subtus ferrugineis ferrugineo-fusco sicut supra transfasciatis.

♀ mari similis, sed alis paullo pallidioribus, anticis ad apicem plaga magna et punctis duobus ultra eam albis; subtus sordide albis ferrugineo vix tinctis, lineolis omnibus distincte notatis.

Hab. GUATEMALA¹, Vera Paz (*F. D. G. & O. S.*), Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*); PANAMA, Bugaba (*Champion*), Calobre (*Arcé*), Lion Hill (*McLeannan*).—COLOMBIA².

This species seems to take the place of *E. lucinda* in Central America and parts of Colombia. From the true *E. lucinda* it differs in several points—its larger size, its somewhat greener and more pointed wings, and the absence of a distinct submarginal row of spots on the secondaries. Its nearest ally is the Brazilian *E. fastidiosa*, which differs in having rather browner wings and the apex of the primaries more pointed and almost falcate. The females of the latter species are of a rather purer white beneath.

Boisduval's type of *Nelone aurimna*, kindly lent us by Mons. C. Oberthür, is marked

as coming from Guatemala. It is a male, and is rather lighter than our Nicaragua specimens, especially the light spot at the apex of the primaries, but not otherwise different. Our Guatemala specimens are all females.

14. **Emesis saturata**, sp. nov.

Alis supra læte saturate brunneis, dimidio basali lineis quibusdam indistinctis fusco-nigris transfasciatis; linea submarginali communi lata pallidiori; subtus ferrugineis nigro maculatis, fascia communi submarginali ejusdem coloris et extra eam maculis minutis serio positis; palpis ferrugineis; anticis acutis paullo hamatis.

Hab. MEXICO, Oaxaca (*Sallé, in Mus. Brit.*).

There is a single male specimen of this species in the British Museum, obtained in Southern Mexico by M. Sallé or M. Boucard. It is allied to *E. fastidiosa* of Brazil, but is darker than the males of that species, the submarginal band of the wings being more definite; beneath, the submarginal line is narrower. The colour of the upper surface at once distinguishes *E. saturata* from *E. aurimna*, its nearest neighbour in point of locality.

15. **Emesis liodes**, sp. nov. (Tab. XLIII. figg. 19 ♂, 20, 21 ♀.)

E. aurimnæ quomodo similis sed multo minor, anticis minus acutis, posticis majis rotundatis angulo anali minus producto, alis ambabus multo fuscесcentioribus; macula subapicali feminæ multo minore.

Hab. MEXICO, Valladolid in Yucatan (*Gaumer*).

Of this species we have three specimens, two males and a female, all from Northern Yucatan. It evidently forms part of the group of *Emesis*, of which *E. fastidiosa* may be considered typical. That it is distinct from *E. aurimna* can, we think, hardly be questioned.

CARIA.

Caria, Hübner, Zutr. ex. Schmett. ii. p. 14 (1823).

This genus contains the section of *Symmachia* having patches of green scales to a greater or less extent upon the upper surface of the wings. On dissecting an example of *C. lampeto*, we find that some of the essential structures are very different from corresponding ones in true *Symmachia*, thus:—

The secondary sexual organs of the male, instead of conforming to those of *Charis*, resemble very closely those parts of *Lasaia* and of our new genus *Exoplisia*; indeed, were it not for the undulating costa and the smooth eyes, we know of no other essential characters whereby to separate it from the latter genus.

The costa of *C. lampeto* is waved as in *Symmachia*; the subcostal nervure emits two branches before the end of the cell and one after it; both discocellulars are atrophied, the middle meets the subcostal at the same point as the upper radial, the lower the median beyond the first joint; the costal and median sides of the cell are subequal. The secondaries have a basal nervure; the discocellulars are atrophied, the upper meets

the subcostal beyond the first branch, the lower the median beyond the second branch; the costal side of the cell is shorter than the median side.

The front legs of the male have the trochanter inserted before the middle of the coxa, the femur < coxa, somewhat dilated in the middle, the tibia > coxa, also dilated, the tarsus = $\frac{3}{4}$ tibia, with a slight constriction near the end, showing the remains of a joint. The palpi have the terminal joint short = $\frac{1}{3}$ middle joint, which is swollen at the base and tapers towards the distal end, the basal joint is tumid = $\frac{1}{2}$ middle joint. The antennæ have thirty-eight joints, whereof the terminal thirteen form a distinct club.

The harpagones have two slender lobes at the end, setose at the extremities; a piece arches over the penis, bearing two small lobes on either side, also setose. The strap from the base of the penis is very strong, and proceeds outwards to the extremity of the harpagones, where it bends abruptly backwards and joins their base; at the bend is a patch of strong spines curving outwards. We find this latter structure repeated in *Lasaia* and *Exoplisia*, and in a modified form in *Bæotis*. The bursa copulatrix of the female has two strong thorn-like processes with granular surfaces.

1. *Caria lampeto*, sp. nov. (*Symmachia lampeto*, Tab. XLII. figg. 8, 9.)

Symmachia amazonica, Godm. & Salv. Trans. Ent. Soc. 1880, p. 125 (nec Bates) ¹.

Alis saturate fuscis, anticis macula triangulari ad basin, fascia lata transversa ultra cellulam ad costam latiore (et extus nigro limbata), posticis ad marginem externum præcipue nitenti-viridibus, anticis ad medium costæ atomis quibusdam æneo-purpureis, macula subapicali rufa, altera ultra eam et lineola submarginali plumbeis, extra hanc maculis elongatis transversis fusco-nigris; subtus viridi-nigricantibus, anticarum cellula coccinea, fronte et thorace viridissimis.

♀ mari similis sed alis dilutioribus, subtus alis fuscis nigro maculatis, anticis dimidio costali maculis ad margines costales medialiter plumbeis, anticis dimidio costali rubro, macula subapicali plumbea.

Hab. GUATEMALA, San Juan in Vera Paz (*Champion*); NICARAGUA, Chontales (*Belt*); PANAMA, Bugaba, *Champion*, Veraguas (*Arcé*).—COLOMBIA ¹.

This species is closely allied to *C. amazonica*, with which we for some time confounded it. On closer examination we find considerable points of difference. The inner margin of the secondaries is devoid of green scales, and the submarginal band is green, not golden, and less clearly defined. The under side is altogether darker.

From both Guatemala and Nicaragua we have but a single specimen; but in the State of Panama it appears to be far from uncommon.

Found about flowering bushes in the second-growth woods and forest margins (*Champion*).

2. *Caria domitianus*.

Hesperia domitiana, Fabr. Ent. Syst. iii. p. 315 ¹.

Symmachia domitianus, Bates, Journ. Linn. Soc. Zool. ix. p. 437 ².

Alis fuscis ad basin nigricante variegatis, lineola submarginali rosaceo-plumbea, inter eam maculis nigris fascia ferruginea positis, anticis plaga magna subtriangulari supra cellulæ finem viridissima, posticis linea submarginali ejusdem coloris; subtus lateritio-rufis nigro indistincte maculatis, posticis maculis submarginalibus nigris et inter eas aliis rosaceo-plumbeis et ad anticarum apicem duabus ejusdem coloris.

♀ mari similis, sed alis pallidioribus, maculis nigris magis, viridi minus, distinctis; subtus fuscis nigro maculatis, anticis dimidio costali rufo, maculis suis medialiter plumbeis.

Hab. NICARAGUA², Chontales (*Belt*).—COLOMBIA²; GUADALUPE¹.

To this species Fabricius's name has been usually attached, and we see no reason for not thus applying it. Its range appears to be very much restricted, the greater number of our specimens being derived from Nicaragua. We have never seen examples in the large collections made in the State of Panama, but we have a specimen from Santa Marta in Colombia.

3. **Caria ino**, sp. nov. (*Symmachia ino*, Tab. XLIII. figg. 22, 23 ♂, 24, 25 ♀.)

Alis fuscis lineola submarginali rosaceo-plumbea, anticis ad cellulæ finem et ad costæ basin atomis variis ejusdem coloris, posticis lineola altera submarginali cæruleo-viridescente; subtus saturate ferrugineis maculis nigris medialiter rosaceo-plumbeis undique dispersis, lineola submarginali in posticis maculosa ejusdem coloris, anticis ad apicem fuscis.

♀ mari similis, sed alis pallidioribus magis rufescentioribus et undique nigro indistincte maculatis; subtus pallide ferrugineis, aliter sicut in mare notatis.

Hab. MEXICO, Ventanas (*Forrer*).

This species is allied to *C. domitianus*, from which it differs in several important points, one of the most obvious being the absence of the glittering green scales above, and in this respect it differs from every other member of *Caria*.

4. **Caria rhacotis**. (*Symmachia rhacotis*, Tab. XLII. figg. 10, 11.)

Symmachia rhacotis, Godm. & Salv. P. Z. S. 1878, p. 363¹.

♀ a femina *C. domitiani* differt, lineola plumbea anticarum submarginali margini multo propiore, posticis quoque plumbeo eodem modo lineolatis; subtus omnino differt, alis undique rufescentibus maculis parvis nigris notatis, iis in areis costalibus plumbeo notatis.

♂ nobis ignotus.

Hab. GUATEMALA, Polochic valley (*Hague*¹); HONDURAS, San Pedro (*G. M. Whitely*¹).

The two specimens described by us are the only ones we have seen. They are both females, not males, as stated in our original descriptions.

5. **Caria harmonia**, sp. nov. (*Symmachia harmonia*, Tab. XLIII. figg. 25, 26.)

C. domitiano similis, anticis ad basin rufescentibus, posticis atomis variis ad angulum analem viridissimis, lineola submarginali quoque viridissima; subtus posticis multo fusciscentioribus, anticarum costa tanta, plumbeo notatis.

♀ nobis ignota.

Hab. PANAMA, Bugaba (*Champion*).—COLOMBIA (*Mus. Brit.*).

A single male specimen from Bugaba is the only one we have seen of this very distinct species. Its nearest ally is perhaps *C. galbula* of Venezuela, from which, however, it differs in many important respects. The colouring of the under side recalls *Mesene zama*.

EXOPLISIA, gen. nov.

On examining the species described by Dr. Felder as *Amarynthia hypochalybe*, we found sufficient important points to necessitate its removal into a separate genus. The second costal branch of the primaries is emitted much nearer the end of the cell than in *Amarynthia*, and there are differences in the secondary sexual organs of the male, which will be described in detail below.

Exoplisia, as we propose to call the genus, is a Colombian insect, stated by Boisduval to occur in Nicaragua.

The subcostal nervure of the primaries emits two branches before the end of the cell, the second being almost opposite the middle discocellular; the third branch is emitted a long way beyond the cell, as is also the upper radial; the lower discocellular meets the median a little beyond the second branch; the costal side of the cell is a little longer than the median side. The secondaries have a strong basal nervure; the atrophied discocellulars run nearly in a line across the wing, the upper meets the subcostal a little beyond the first branch, the lower the median beyond the second branch; the costal side of the cell is much shorter than the median side.

The front leg of the male has the trochanter inserted before the middle of the coxa; femur = $\frac{1}{2}$ coxa, and is considerably dilated towards its distal end; the tibia is also dilated = $\frac{3}{4}$ coxa; tarsus = tibia, a constriction near its extremity indicates the remains of a joint; there are two or three spines close to the end, and two or three others distributed sporadically. The eyes are hairy.

The male secondary sexual organs are very similar to those of *Lasaia* and *Caria*. The harpagones are single lobes, setose and rounded at the extremity; they are united by a piece which passes over the penis, and is slightly convex outwards, with a short point in the middle line, where it is covered with long setæ; dependent from this on either side of the penis is a stout slightly upturned hook, blunt at the end and setose along its upper edge; outside these, again, are two short subtriangular setose lobes. The penis is sickle-shaped; from the angle the strap proceeds outwards, makes a fold near its extremity, and then turns abruptly backwards to the base of the harpagones; close to the bend on the upper side is a cluster of spines, curved outwardly, just as in *Lasaia* and *Caria*. In the former genus *Exoplisia* might well be placed, were it not that the palpi do not project as is the case in *Lasaia*.

1. *Exoplisia hypochalybe*.

Amarynthia hypochalybe, Feld. Wien. ent. Monatschr. v. p. 98¹; Voy. Nov. Lep. p. 293, t. 37. ff. 21, 22².

Nelone praxithea, Boisd. Lep. Guat. p. 24³.

Alis fuscis lineis angustis transfasciatis, iis in dimidio proximo duplicatis, exterioribus marginibus subparallelis; subtus chalybiis, costa, marginibus et fasciis transversis nigris.

Hab. NICARAGUA (fide Boisduval³).—COLOMBIA^{1 2}.

M. C. Oberthür tells us that the species described by Boisduval as *Nelone praxithea* is identical with the Colombian insect called *Amarynthia hypochalybe* by Dr. Felder. Boisduval is the only authority we have for including it in our fauna.

PEROPHTHALMA.

Perophtalma, Westwood, Gen. Diurn. Lep. p. 455 (section ** of *Mesosemia*).

Mesosemia tenera has usually been considered an aberrant form of *Mesosemia*, but the characters of the venation of the primaries differ so positively that its generic separation seems demanded.

As already stated, *Mesosemia* has four branches to the subcostal nervure to the primaries, two before and two beyond the end of the cell; the upper radial and the middle discocellular leave the subcostal at the same point, so that there is no upper discocellular. In *Perophtalma* the subcostal emits only three branches, two before and one beyond the end of the cell; the middle discocellular joins the upper radial some way beyond the junction of the latter with the subcostal, so that there is a well-defined upper discocellular. These points make it necessary that *Perophtalma* should be removed altogether from the neighbourhood of *Mesosemia*. Its position here, however, must be considered provisional.

The front legs of the male have a very long coxa, the trochanter joint being placed at about two thirds from the base; the femur is exceedingly short but thick $< \frac{1}{2}$ coxal projection; tibia $>$ femur + trochanter, tarsus = tibia.

The male secondary organs are very like those of *Mesosemia grandis*, but inside the cavity of the penis is a row of serrate papillæ.

1. *Perophtalma tenera*.

Mesosemia tenera, Westw. Gen. Diurn. Lep. p. 455¹; Hew. Ex. Butt., *Mesosemia*, t. 3. f. 19²; Bates, Journ. Linn. Soc. Zool. ix. p. 419³.

Alis pallide fuscis, anticis fascia transversa per cellulam ad marginem internum extensa albida; ocello ad cellulam finem nigro, albo bipupillato et fulvo ciliato; striis undulatis pallidis submarginalibus; posticis area discali ochracea, striis undulatis pallidis submarginalibus; subtus ut supra sed alis paullo dilutioribus.

♀ mari similis.

Hab. GUATEMALA, Choctum (*Hague*), Cubilguitz, Cahabon, San Isidro, Zapotes, Mirandilla (*Champion*); HONDURAS¹; NICARAGUA, Chontales (*Belt*); COSTA RICA, Irazu (*Rogers*); PANAMA, Volcan de Chiriqui, Bugaba, David (*Champion*), Calobre (*Arcé*).—COLOMBIA; VENEZUELA¹³; ECUADOR; AMAZONS¹³; GUIANA; BRAZIL².

There appear to be two forms of this insect, which seem to blend together insensibly. The prevalent form throughout our region has a white band across the primaries. In South America this is much less perceptible. But of this southern form we have examples from Nicaragua and the State of Panama.

P. tenera seems to be common throughout Central America, as Mr. Champion obtained a large series of specimens, all of which he captured in the hot country, the species frequenting the sunny openings in the forest, and sometimes to be seen in numbers in one little spot; the insect rests on the upper sides of the leaves, and has much the habit of *Mesosemia*.

Mr. Butler considers the Guiana form of this species to be the *Papilio tullius* of Fabricius; but this identification is open to great doubt.

d'. Palpi, especially those of the female, projecting beyond the forehead*.

BÆOTIS.

Bæotis, Hübner, Verz. bek. Schmett. p. 21 (1816); Westwood, Gen. Diurn. Lep. p. 451 (1851).
Bæotis, Bates, Journ. Linn. Soc. Zool. ix. 395 (1868).

There are about twelve species of this genus, which spreads to South-eastern Brazil, one only occurs within our region, it is generally, though sparingly, distributed from Southern Mexico to Panama.

The subcostal branch of the primaries in *B. zonata* emits two branches before the end of the cell and one after, the middle discocellular meets the subcostal close to its junction with the upper radial, the lower the median just beyond its second branch, the costal side of the cell is considerably longer than the median side. The secondaries have a strong basal nervure, the upper discocellular meets the subcostal some way beyond the first branch, the lower the median a little beyond the second branch, the costal and median sides of the cell are subequal.

The front legs of the male have the trochanter inserted beyond the middle of the coxa, the femur, tibia, and tarsus are all very short but thick, the tarsus is a little shorter than the femur, the tibia longer than either of them. The palpi are rather long, the terminal joint bulbous and not attenuated, = about $\frac{1}{3}$ middle joint. The antennæ have thirty-seven joints, of which the terminal twelve form a moderate club.

The harpagones of the male secondary sexual organs are elongated and appear to have two small lobes at the extremity, both of them setose, and a piece stretching across above the penis in the form of an arch, beneath in the middle line is a long slightly upturned rod, terminating in a blunt upturned point, on either side of which is a pair of strong hooks starting backwards and bending upwards, the strap from the penis runs directly into this rod instead of curving backwards to the harpagones.

The structure of these parts is extremely different from that of *Charis* and its allies, with which *Bæotis* has usually been associated.

* The following genera also belong here:—*Eurygina*, *Catagrammina*, *Uraneis*, and *Stalachtis*.

1. *Bæotis zonata*.

Bæotis zonata, R. Feld. Verh. k.-k. zool.-bot. Ges. 1869, p. 469¹.

Mesene simbla, Boisd. Lép. Guat. p. 22².

Charis libna, Butl. Ann. Mag. N. H. ser. 4, v. p. 364³; Lep. Ex. p. 40, t. 14. f. 1⁴.

Alis flavidis marginibus externis late fuscis, maculas duas flavidas includentibus, fascia communi obliqua marginem posticarum internum haud attingente et anticarum costa, fuscis, lineola submarginali et maculis ad angulum posticarum analem plumbeis; subtus pallidioribus, lineola et maculis plumbeis absentibus; corpore supra fusco, subtus cum cruribus flavidis.

Hab. MEXICO³, Potrero (*Hedemann*¹); GUATEMALA², Polochic valley (*Hague*); COSTA RICA, San Francisco (*Rogers*); PANAMA, Volcan de Chiriqui (*Champion*), Calobre (*Arcé*). —COLOMBIA.

We compared our Panama specimens with the types in the Vienna Museum and found that they agreed. It is nowhere a common species though widely distributed. We have a single example from Guatemala, though Mr. Champion did not meet with it.

We have the type of Mr. Butler's *C. libna*, they differ in no way from *B. zonata*, and Boisduval's type of *Mesene simbla* kindly lent us by Mons. C. Oberthür belongs to the same species.

METACHARIS.

Metacharis, Butler, Ent. Month. Mag. iii. p. 174 (1867).

This genus contains seven or eight species distributed throughout Tropical America, only one occurring within our borders. It was separated from *Charis* by Mr. Butler, who included it in five species. To these Mr. Bates in his synopsis of the family added five others, but restored *Charis cadmeis* to the genus *Charis*, he also placed with *Metacharis* three members of Hübner's genus *Echenais*, which, from their coloration alone, seem fairly separable.

The subcostal nervure of the primaries of *M. victrix* emits the first branch before the end of the cell, the second close to the end, and the third a long way beyond it; the lower radial meets the subcostal some way beyond the end of the cell, the discocellulars are both atrophied and curved slightly inwards, the upper leaves the subcostal just beyond the origin of the second branch, the lower meets the median just beyond the second branch; the costal side of the cell is longer than the median side. The secondaries have a basal nervure; the discocellulars are atrophied, the upper leaves the subcostal a little beyond the first branch, the lower meets the median a little beyond the second branch; the costal side of the cell is longer than the median side.

The front legs of the male have the coxa considerably produced beyond the trochanter joint; the femur is short and dilated towards its distal end; the tibia = 2 femur; tarsus = femur, single-jointed. In the front legs of the female, the terminal joint of the tarsus is longer than the three preceding joints together, and has a setose pad on the under surface; the second, third, and fourth joints have each a long spur

from the distal ends of the under surface. The terminal joint of the palpi is very slender = about $\frac{1}{4}$ middle joint, which is rather stout. Antennæ with thirty-eight joints, the club being not abruptly thickened at the extremity.

The tegumen in the male sexual organs is bilobed, each lobe being setose on its outer surface, towards the ends there is a central keel and two strong lateral hooks. The harpagones are small with simple points and setose ends. Above the penis is a hood-shaped piece with two lateral lobes on either side from the end of the upper one, and from the base of the lower one are strong setæ; a long strap proceeds from the base of the penis and thence bifurcates to the harpagones, and beyond again continues in a strong deflexed spine; the penis itself is long and slender, slightly deflexed towards its extremity, bent to a right angle towards its base, which is bulbous. The bursa copulatrix of the female has two mammæ-like projections with granular surfaces.

1. **Metacharis victrix.** (*M. nigrella*, Tab. XLIV. figg. 9, 10 ♂, 11, 12 ♀.)

Charis victrix, Hew. Equat. Lep. p. 50¹.

♂ alis supra saturate ferrugineis cæruleo plus minusve purpureo lavatis, bitriente basali nigro irregulariter maculatis, anticarum apicibus maculis duabus nigris rufō circumeinctis, striolis utrinque plumbeis; posticis maculis submarginalibus rufis et inter eas lineolis plumbeis; subtus lætissime ehalybeo-cyaneis.

♀ alis ferrugineis undique nigro maculatis, striolis plumbeis inter maculas submarginales; subtus ut supra sed alis multo pallidioribus maculis nigris magis obviis.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA, Volcan de Chiriqui, Bugaba (*Champion*). — COLOMBIA; ECUADOR¹.

This species seems to be rather variable as regards the colour of the males, and this without reference to locality. Some specimens are more ferruginous on the upper surface of the wings, and the primaries are more elongated, beneath the shade of blue is not quite so pure and has a greenish tint.

Mr. Champion obtained many specimens of both sexes of this insect in sunny open places in the dense forest. This species rests with the wings expanded on the upper surface of the leaves, but when disturbed it hides itself beneath. Our Colombian examples were recently taken by Mr. Wheeler, and the types from Ecuador by Buckley at Saryack.

We have figured a male from Bugaba and a female from Chontales, Nicaragua.

LASAIA.

Lasaia, Bates, Journ. Linn. Soc. Zool. ix. p. 397 (1868).

There are two species belonging to this genus, one confined to the Amazons valley and the other extending from Mexico to South-east Brazil.

The subcostal nervure of the primaries in *L. meris* emits two branches before the end of the cell and one after it; the discocellulars are atrophied, the middle meets the

subcostal at the same point as the upper radial, the lower the median a little beyond the second branch; the costal and median sides of the cell are nearly equal. The secondaries have a strong basal nervure; the discocellulars are atrophied, the upper meets the median a little beyond the first branch, the costal side of the cell is a little shorter than the median side.

The front legs of the male have the trochanter inserted about the middle of the coxa; the femur $= \frac{1}{2}$ coxa; tibia $= \frac{3}{4}$ coxa; tarsus long $> \frac{3}{4}$ coxa, there is a constriction near the end indicating a rudimentary joint, and a strong seta at the extremity.

Palpi have a long terminal joint $> \frac{1}{3}$ middle joint. The eyes are hairy. The antennæ have forty-three joints, of which the terminal eighteen form a slender club.

The harpagones in the secondary sexual organs of the male are bilobed, each setose at the extremity, the lower lobe is broad, the upper one somewhat pointed and directed upwards; there is a central arch over the penis, and the strap proceeding from near the base is directed outwards to beyond the harpagones, it then returns abruptly to their base, at the bend the strap is spread out vertically, and on its top there is a pad of strong papillæ directed outwards.

1. *Lasaia meris*.

Papilio meris, Cram. Pap. Ex. t. 366. B, C¹.

Lasaia meris, Bates, Journ. Linn. Soc. Zool. ix. p. 445².

Erycina agesilas, Latr. in Humb. & Bonp. Obs. Zool. i. p. 251, t. 25. ff. 7, 8³.

Alis glaucis nonnunquam fusciscentibus, maculis transversis nigris frequenter notatis; subtus fusco-violaceis aut ochraceis, fascia submarginali communi pallidiori, lenticulis plurimis nigris interspersis.

♀ mari similis sed alis fusciscentioribus.

Hab. MEXICO, Oaxaca (*Fenochio*), Valladolid in Yucatan (*Gaumer*); GUATEMALA², San Gerónimo, Chisoy, Polochic valley (*F. D. G. & O. S., Champion*), Panima (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA, Cache (*Rogers*); PANAMA, Chiriqui (*Arcé*), Bugaba (*Champion*).—SOUTH AMERICA, Colombia² and Amazons valley³ to Brazil.

This is a very variable species, as regards the tint of both surfaces of the wings; but we are unable to trace any definite lines of difference between the extreme forms. The number of back spots and their size also vary, and in some specimens, especially towards the costal margin of the primaries, the spots become confluent.

L. meris appears to be an abundant species throughout Tropical America, and we have specimens from all parts of our region from Mexico to Panama.

It is of a different habit from most of its allies, being found about the banks of rivers in thinly wooded districts, where it is fond of settling on the damp sandy margins or upon partly submerged rocks. It is a very active species on the wing, and difficult to capture (*Champion*).

THAROPS.

Tharops, Hübner, Verz. bek. Schmett. p. 109 (1816); Butler, Journ. Linn. Soc. Zool. ix. p. 222 (1867).

Lemonias, sect. i. *Tharops*, Westwood, Gen. Diurn. Lep. p. 458 (1851).

We are acquainted with twelve species belonging to this genus distributed from Guatemala in the north to Panama, and thence southward to Southern Brazil.

In the 'Genera of Diurnal Lepidoptera' *Tharops* is included as a section of *Lemonias*, and so remained until Mr. Butler in 1867 definitely separated it, chiefly on account of the shape and colour of the wings, the anal angle of the secondaries being more or less produced. The body also is more robust than in typical species of *Lemonias*. In the section containing *T. menander*, represented in our country by *T. purpurata*, there is a pencil of black hairs near the middle of the inner margin of the secondaries; this serves to distinguish this group from *T. pretus* and its allies, where no such pencil exists. In *T. hebrus* there is a patch of white hair near the anal angle.

The subcostal nervure of the primaries of *T. hebrus* emits two branches before the end of the cell and one after it; the discocellulars are atrophied, the upper meets the subcostal at the same point as the upper radial, the lower the median a little beyond the second branch; the costal side of the cell is a little longer than the median side. The secondaries have a basal nervure; the discocellulars are atrophied, the upper meets the subcostal a little beyond the first branch, the lower the median just beyond the second branch; the costal and median sides of the cell are nearly equal.

The front legs of the male have the trochanter inserted about the middle of the coxa; the femur $< \frac{2}{3}$ coxa; tibia = coxa; tarsus = $\frac{3}{4}$ tibia; the terminal tarsal joint of the front leg of the female is longer than the second one, and has a setose pad beneath; the second, third, and fourth joints terminate beneath with two strong spines. The palpi are long; the terminal joint long and tapering, = $\frac{1}{2}$ middle joint. The antennæ are slender, with forty-six joints, the terminal thirteen forming a slight club.

Each harpago bears a strong outwardly directed slightly upturned spine; the penis is strong, decurved towards its extremity, and with the usual strap connecting it with the base of the harpagones. The bursa copulatrix of the female has two very large thorn-like prominences of granular texture.

a. Secondaries with a tuft of black hair near the middle of the abdominal side.

1. ***Tharops purpurata*.** (Tab. XLIV. figg. 15, 16.)

Tharops purpurata, Godm. & Salv. P. Z. S. 1878, p. 365¹.

Alis nitide purpureo-cæruleis, anticis regione apicali et posticis ad apicem fusco-nigris, anticis maculis elongatis transversis; subtus cinereo-albis, anticis ad apicem et marginibus externis alarum ambarum fusciscentibus, maculis minutis fuscis notatis, iis proximis angulos apicales et anales anticarum maximis.

♀ mari similis sed alis obtusioribus et posticis supra, velut anticis, maculis elongatis nigris notatis.

Hab. GUATEMALA, Polochic valley (*Hague*¹); NICARAGUA, Chontales (*Belt*); PANAMA, Bugaba (*Champion*), Calobre (*Arcé*²).

In describing this species we compared it with *T. menander*, and mentioned the more purple tint of the wings above; this we now find to be a variable character, as the colour in these wings passes from purple to blue without reference to locality. The under surface is decidedly whiter and the spots smaller, especially those of the apical and anal angles of the secondaries.

T. purpurata is nowhere a common species, though it has been met with over a widish area within our country.

b. No brush of hairs near the middle of the abdominal margin of the secondaries.

2. *Tharops isthmica*. (Tab. XLIV. figg. 13, 14.)

Tharops isthmica, Godm. & Salv. P. Z. S. 1878, p. 366¹.

Alis viridi-cyaneis, anticis, costa margine externo late (lineola submarginali excepta), maculis tribus in cellula et quatuor infra eam nigris, posticis angulo apicali maculisque submarginalibus aliisque ad marginem internum nigris; subtus albidis rosaceo variegatis, maculis tribus in cellula anticarum hujus coloris.

Hab. PANAMA, Calobre (*Arcé*¹).

There are two males only of this species in our collection. It is allied to *T. splendida* of the Amazons valley, but besides being smaller, the ground colour of the wings beneath is nearly uniformly sprinkled with pinkish scales; the allied species has the central area of both wings nearly white; there are no conspicuous spots at the apical angle of the secondaries.

3. *Tharops picta*, sp. nov.

Alis nigris, cæruleo-viridi maculatis, lineola submarginali et extra eam lunulis coloris ejusdem; subtus fulvescentibus, anticis dimidio anali nigro, dimidio costali et posticis omnino albo maculatis.

♀ mari similis, colore viridi pallidiori; subtus anticis ad apicem immaculatis, posticis ad marginem externum albo atomatis.

Hab. GUATEMALA, Panzos (*Champion*); NICARAGUA, Chontales (*Belt*).—COLOMBIA.

This species is closely allied to *T. pretus* of Guiana and the Amazons valley, from which, however, the male may be readily distinguished by the bluer tint of the spots on the upper surface; the female is spotted like the male, whereas that sex in the allied species has the spots whitish brown with scarcely a shade of green. We have three specimens of *T. picta*, one from each of the localities mentioned above.

LEMONIAS.

Lemonias, Westwood, Gen. Diurn. Lep. p. 457 (1851); Butler, Journ. Linn. Soc. Zool. ix. p. 213 (1867).

According to Mr. Bates's arrangement this genus would contain about seventy species
BIOL. CENTR.-AMER., Rhopal., Vol. I., February 1886.

but we remove from it the fourth section (*Hamearis*) containing upwards of twenty species; these constitute our genera *Hamearis*, *Apodemia*, and *Polystigma*. As compared with the genera just named, *Lemonias* can be distinguished by the front legs in the male having a single tarsal joint, and the primaries with no upper discocellular. In *Hamearis* this nervule is distinctly present; in *Apodemia* the tarsus of the front leg of the male has two joints; in *Polystigma* not only has the front leg of the male three distinct joints, but the third seems to be the fusion of the third, fourth, and fifth; moreover, the extremity of the tarsus has a distinct pair of claws. Basing our division of the old genus *Lemonias* on these characters we seem to get very natural groups. *Lemonias* itself is thus a purely neotropical genus, having its focus in the Amazons valley; in our region the number of species decreases towards the north; thus in the State of Panama we find no less than ten of our fourteen species, in Nicaragua five, in Guatemala four, and in Mexico only one.

The subcostal nervule of the primaries in *L. sudias* emits two branches before the end of the cell and one after it; the lower and middle discocellulars are both atrophied for the greater part of their length, the upper meets the subcostal at the same point as the upper radial, the lower the median just beyond the second branch; the costal and median sides of the cell are subequal. The secondaries have a basal nervule; the discocellulars are both atrophied, the upper meets the subcostal beyond the first branch, the lower the median just beyond the second branch, the costal and median sides of the cell are subequal.

The front legs of the male have the trochanter inserted beyond the middle, the femur $< \frac{1}{2}$ coxa, tibia $<$ coxa, tarsus (single-jointed) nearly = tibia; there is a short seta at the extremity; the terminal joint of the female = second joint, and has a setose pad beneath; the second, third, and fourth joints terminate beneath with a spine. The palpi have a long terminal joint (longer in the female than in the male), $= \frac{1}{3}$ middle joint (in female $> \frac{1}{2}$). The antennæ have forty-eight joints, of which the terminal fourteen form a moderate club.

The harpagones in the secondary sexual organs of the male have a projecting lobe slightly setose at its end, above this is a long slender rod rounded at the end and setose in the middle; the penis is long and slightly decurved, and the usual strap connects it with the base of the harpagones. In *L. æmulius* the tegumen has distinct dentate projections on both lobes; the harpagones appear to consist of two slightly overlapping lobes, the upper one bearing two strong dentate processes. In *L. penthea* the outer margin of the lobes of the tegumen is also dentate; the harpagones have a single lobe terminating with a short, strong upturned point. In *L. æmulius* the harpagones are single-lobed, with two dentate processes at the end. The penis is shorter and stouter than in either of the two preceding genera, and shows an elongated patch of spines towards the distal end. In *L. irenea* the harpagones terminate in a strong gradually tapering slightly upcurved point. The penis is both long and stout, and

rather abruptly decurved towards the distal end; there is a spinous patch near the proximal end.

Regarding the bursa copulatrix of females, we note nothing in *L. sudias* or in *L. æmulius*; in *L. penthea* are two hemispherical structures each terminating in a chitinous edge armed with five distinct dentations; the teeth of these two structures fit into each other like the cogs of two wheels; there seems to be a duct leading from them towards the exterior opening. We have not previously met with any structure like this, and we cannot speak very positively respecting it.

a. Sexes similar.

1. *Lemonias adelina*. (Tab. XLVII. figg. 9, 10.)

Lemonias adelina, Butl. Cist. Ent. i. p. 79¹; Butl. & Druce, P. Z. S. 1874, p. 354².

Anticis supra fusco-nigris maculis magnis obscurioribus valde distinctis notatis, eis in cellula et ad marginem externum griseo-cæruleo tenuissime circumcinctis, regione costali quoque ejusdem coloris, angulo anali atomato et posticis (præter basin) latissime aurantiis; subtus maculis paginæ superioris griseo distincte marginatis et inter eas hoc colore atomatis, posticis fere albis maculis quibusdam nigricantibus ad costæ basin. Antennis nigris albo crebre annulatis.

♀ mari similis sed posticis sordide albidis nec aurantiis distinguenda.

Hab. COSTA RICA (*Van Patten*^{1 2}), Cache (*Rogers*); PANAMA, Volcan de Chiriqui (*Champion*).

Mr. Butler, who described this species, compares it with *L. æmulius* of South America, a butterfly to which it is certainly very closely allied. The orange colour of the secondaries is deeper in tint and extends nearer the base, and the primaries are darker, their spots being much less distinctly margined with grey.

Van Patten's collection contained four specimens, which are all we have seen from Costa Rica. Mr. Champion only captured a single male in Chiriqui; this was taken on the margin of the forest region west of the volcano at an elevation of 4000 feet.

2. *Lemonias lilina*. (Tab. XLIV. fig. 21.)

Lemonias lilina, Butl. Ent. Monthl. Mag. vi. p. 252, t. 1. f. 8¹.

Anticis rufo-brunneis cæruleo variegatis, plaga magna triangulari ad medium costæ, angulo anali et bitrionto parte marginis interni et posticis præter basin niveis, anticis linea valde sinuata transversa plagam costalem attingente nigra. Antennis albo annulatis.

Hab. MEXICO¹ (??); PANAMA, David (*Champion*).

The type of this pretty species was presented to the British Museum by E. Doubleday in 1848 with fifty-nine other butterflies from various localities. Its Mexican origin must be considered more than doubtful. We have lately received fresh specimens from Mr. Champion, who met with the species flying about bushes in the thinly wooded savanna regions of the low country.

3. *Lemonias densemaculata*. (Tab. XLIV. fig. 19.)

Lemonias densemaculata, Hew. Equat. Lep. p. 53¹.

Lemonias debilis, Godm. & Salv. P. Z. S. 1878, p. 366².

Alis obscure fuscis, ochraceo irroratis, maculis fuscis ochraceo marginatis undique notatis, maculis his ad margines externos conjunctis; subtus ut supra sed alis pallidioribus et magis ochraceis.

♀ mari similis.

Hab. NICARAGUA, Chontales (*Belt*²); PANAMA, Chiriqui (*Rippe*²).—ECUADOR¹.

When describing this species in 1878 we did not recognize its identity with the insect from Ecuador, called *L. densemaculata* by Hewitson.

It is apparently a scarce species though of wide range. Mr. Champion did not meet with it during his stay in Chiriqui.

There is a specimen of this species from Nicaragua in the Hewitson collection under Hübner's name *Echenais leucophaea*. We apply this title to an allied form from Guiana, probably the same as *L. aristus* (Stoll).

4. *Lemonias glauca*, sp. nov. (Tab. XLIV. fig. 20.)

Alis glauco-cæruleis undique fusco maculatis, lineola submarginali nigra, anticis ad marginem externum fuscis, annulis quinque submarginalibus cærulescentibus; subtus albicantibus fusco ut supra maculatis.

Hab. COSTA RICA, Cache (*Rogers*).

We have a single example of this species obtained by Mr. Rogers; unfortunately it is much damaged, the head and abdomen being wanting. The primaries are much rounded, from which we infer that the specimen is a female.

It is most nearly allied to *L. curulis* and *L. zerua*.

5. *Lemonias theages*. (Tab. XLIV. fig. 22.)

Lemonias theages, Godm. & Salv. P. Z. S. 1878, p. 366.

Alis obscure fuscis, anticis albo maculatis, macula ad cellulæ finem, altera infra eam maximis, posticis area discali alba, punctis basalibus et serie submarginali albis; subtus ut supra, posticis ad basin albis fusco-nigro maculatis, ciliis alterne fuscis et albis.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA, Cache (*Rogers*¹); PANAMA, Bugaba (*Champion*), Veraguas (*Arcé*¹).

The nearest ally to this species is *L. orpheus* of the Amazons valley, but the white spots of the primaries are much larger and the dark margin of the secondaries broader.

We have only received five specimens of this species from various points between Nicaragua and Panama.

Low forest region west of Bugaba (*Champion*).

*b. Sexes dissimilar.**a'. Anal angle of secondaries rounded.***6. *Lemonias pelarge*.** (Tab. XLIV. figg. 17, 18.)*Lemonias pelarge*, Godm. & Salv. P. Z. S. 1878, p. 366¹.

Anticis ad basin et posticarum margine externo fusco-nigris, illis maculis indistinctis apicem versus cæruleis, mæcula ad angulum analem et harum area interna (basi excepta) rufo-aurantiis; subtus griseo-cæruleis fusco-nigro maculatis, margine externo anticarum late, posticarum anguste, fusco-nigris, abdomine supra nigricante, infra griseo.

♀ adhuc ignota.

Hab. GUATEMALA, Polochic valley (*Hague*¹), Cahabon (*Champion*).

This species is closely allied to *L. parthaon* of Guiana and the Amazons valley; the blue spots of the wings are smaller, there is an orange-red spot near the anal angle of the primaries, and this colour extends almost to the very base of the secondaries. Beneath, the primaries have more blue-grey, and the submarginal spots of the secondaries are obsolete; moreover, the abdomen above is black instead of being rufous, as in the allied species.

Our first example of this *Lemonias* was sent us from the Polochic valley by Mr. Hague, a second specimen was taken by Mr. Champion near Cahabon in the adjoining valley. These are all we have seen.

7. *Lemonias cilissa*.*Lemonias cilissa*, Hew. Ex. Butt., *Lemonias*, 4. f. 33, 34¹; Bates, Journ. Linn. Soc. Zool. ix. p. 447².

Alis rufo-fuscis, anticis punctis tribus subapicalibus albis, area medianâ ad marginem internum et posticis fulvis, lineolis nigris transversim notatis; subtus nigro maculatis, maculis submarginalibus albis, anticis fuscis ad marginem internum pallide ochraceis, posticis (præter marginem externum fuscum) albis.

♀ alis pallide cervinis maculis transversis tenuissimis vix notatis, anticis margine externo late fusco, maculas submarginales albas includente, posticis maculis albis fusco cinctis in serie submarginali positiss; subtus fere ut supra sed paullo pallidioribus.

Hab. NICARAGUA², Chontales (*Belt*¹); PANAMA, Chiriqui (*Ribbe*), Bugaba (*Champion*).

Except in Costa Rica, where the species does not appear to exist, *L. cilissa* is very common from Nicaragua to the district of Chiriqui in the State of Panama. We have received a large number of specimens from the latter locality.

Some variation is noticeable amongst them, the secondaries of the males, especially in Nicaraguan specimens, are darker at the base; intermediate examples occur everywhere. Hewitson's types are from Nicaragua.

Frequents low bushes in the second-growth woods of the "terra caliente" (*Champion*).**8. *Lemonias pseudocrispus*.**

Lemonias pseudo-crispus, Westw. in Doubl. & Hew. Gen. Diurn. Lep. p. 459¹; Butl. Journ. Linn. Soc. Zool. ix. p. 216, t. 6. ff. 9, 10²; Bates, Journ. Linn. Soc. Zool. ix. p. 447³.

Papilio crispus, Cram. Pap. Ex. t. 118. F (nec D, E)⁴.

Lemonias maculata luciana, Hübn. Samml. ex. Schmett. i. t. 36. ff. 3, 4 (nec Fabr.)⁵.

Lemonias nepioides, Butl. Journ. Linn. Soc. Zool. ix. p. 217, t. 6. ff. 12, 13⁶.

Lemonias nepia, Westw. & Hew. Gen. Diurn. Lep. p. 459, t. 73. f. 2⁷.

Alis testaceis nigro maculatis, costa et margine externo anticarum fusco-nigris; subtus glaucis nigro maculatis, posticarum dimidio costali fusco nebuloso.

♀ mari similis, sed area anticarum discali pallidior, posticarum fusciscentior, differt.

Hab. PANAMA, Bugaba (*Champion*), Veraguas (*Arcé*).—SOUTH AMERICA, Colombia to Amazons valley^{3 6 7}, and Brazil¹.

We do not see our way to separate this species under the various names that have been suggested for it, and we have followed Mr. Bates in uniting them under the name of *L. pseudocrispus*, adding *L. nepia* as an additional synonym.

The supposed differences are based upon slight modifications of colour and size, but on looking through our series of specimens, which certainly includes all the so-called species, we do not see our way to grouping them definitely.

The female is more variable than the male, some specimens having the disc of the secondaries of a pale fawn colour.

It is a scarce species in the State of Panama, as Mr. Champion only took one pair.

9. *Lemonias agave*, sp. nov. (Tab. XLVII. figg. 7, 8.)

Alis rufescente-fuscis ad basin et ad margines externos ferrugineis et undique fusco sparsim maculatis, alis ambabus macula discali alba parva inter ramos medianos, posticis altera costam propiore, plaga magna anali marginis interni dimidium includente nivea; subtus glaucescentibus, fusco sparsim maculatis, anticis fere omnino pallide fusciscentibus, posticis ad marginem externum eodem colore indutis.

Hab. PANAMA, David (*Champion*).

Mr. Champion obtained two male specimens of this species, which, though differing in many important points, seems more nearly related to *L. pentheus* of the Amazons valley and Guiana than to any other species of the genus.

L. agave frequents the thinly wooded savanna-region of the low country.

10. *Lemonias zeurippa*. (Tab. XLV. figg. 4, 5.)

Hypophylla zeurippa, Boisd. Sp. Gén. t. 20. f. 5¹.

Lemonias zeurippa, Bates, Journ. Linn. Soc. Zool. ix. p. 447².

L. lasthenes similis, anticis dimidio apicali purpurecente cæruleis, posticis plaga submarginali multo magis rotundata et rufescentior.

♀ nobis ignota.

Hab. MEXICO^{1 2}; GUATEMALA, Choctum (*Hague*).

Boisduval named and figured this species from a Mexican specimen. It appears to be a very rare insect, as the only example we have ever seen was sent us by Mr. Hague from Choctum in the low-lying forest country of Vera Paz. As a species it is perfectly distinct from *L. sudias*, its congener in the same country.

11. *Lemonias sudias*.

Lemonias sudias, Hew. Ex. Butt., *Lemonias*, t. 2. ff. 12, 13, 14¹; Bates, Journ. Linn. Soc. Zool. ix. p. 447².

Alis fuscis, anticis area interna purpurecente-cæruleis fusco sparsim notatis, posticis rufescentioribus margine externo rufescente-fulvo; subtus griseis et sicut supra punctatis, posticis margine externo pallide fulvo.

♀ alis fuscis, anticis fascia lata transversa alba bisectis, apice intra eam saturatius fusco; subtus griseis fascia alba anticarum sicut supra, aliter mari similis, posticarum margine externo fulvo absente.

Hab. GUATEMALA², Polochic valley, Choctum (*Hague*), San Juan in Vera Paz, Senahu, Panima, Chiacam, Cahabon, Panzos (*Champion*); HONDURAS¹.

This distinct species is the only one of this section of the genus in which the fulvous margin of the secondaries is reproduced on the under surface, in other respects it much resembles *L. zeurippa* and *L. lasthenes*. It was originally described by Hewitson from specimens said to have come from Honduras. In Guatemala it is by no means uncommon in the forest-districts of Vera Paz, whence we have received many specimens of both sexes; these are very constant in their characters, the females alone differing slightly in the width of the white band of the primaries.

12. *Lemonias lasthenes*. (Tab. XLV. figg. 1, 2 ♂, 3 ♀.)

Lemonias lasthenes, Hew. Ent. Monthl. Mag. vii. p. 5¹; Ex. Butt., *Lemonias*, t. 5. f. 47².

Alis fuscis dimidio apicali cærulescente, ad marginem internum rufescentibus, lineis duabus transversis ultra cellulam, altera brevi ad cellulæ finem et margine externo ipso nigris, ciliis hic illic albis, posticis rufescente fuscis nigro bivittatis, plaga magna submarginali fulva angulum apicalem haud attingente; subtus glauco-cæruleis nigro transversim lineolatis, marginibus externis fuscis albido maculatis, posticis maculis duabus duplicibus una ad angulum apicalem, altera ad angulum analem.

♀ alis fuscis indistincte maculatis, anticis fascia obliqua flava lata bisectis, angulo apicali ultra eam saturate fusco et maculis indistinctis cæruleis notatis; subtus fere ut in mare sed pallidioribus et fascia flavida sicut in pagina superiore.

Hab. NICARAGUA, Chontales (*Belt*^{1 2}); PANAMA, Bugaba (*Champion*).

Hewitson's specimens were given him by Belt, who took them in Nicaragua, but the figure of the type represents a much more rufous insect than our specimens from the same source.

Our female examples from Nicaragua are much worn and faded, and we have described a specimen of that sex from the State of Panama; this can at once be recognized from the female of *L. sudias* by the transverse band of the primaries being yellow instead of white.

b'. Anal angle of secondaries produced.

13. *Lemonias irenea*.

Papilio irenea, Cram. Pap. Ex. t. 328. C, D¹.

Lemonias irenea, Butl. & Druce, P. Z. S. 1874, p. 354².

Papilio belise, Cram. Pap. Ex. t. 376. E, F³.

Lemonias belise, Bates, Journ. Linn. Soc. Zool. ix. p. 450⁴.

Alis nigricantibus fascia communi lata cæruleo utrinque limbata a vena anticarum mediana ad marginem posti-

earum internum, anticis macula ovali transversa ultra cellulam alba, posticis lineola submarginali cæruleo; subtus fulvis, sicut supra albo notatis, fascia communi nigro laud cæruleo limbata, fascia anticearum cellulari et posticearum basi albis, marginibus externis albo indistincte bilineatis.

♀ mari similis sed supra colore cæruleo absente et fascia indistincta submarginali notatis.

Hab. GUATEMALA, Cajabon, Panzos, Chacoj, Telemán (*Champion*), Polochic valley (*F. D. G. & O. S.*); COSTA RICA (*Van Patten*), Cache (*Rogers*); PANAMA, Veraguas (*Arcé*), Lion Hill (*M'Leannan*).—SOUTH AMERICA, Colombia to Guiana⁴ and Amazons valley⁴.

There can be no doubt that Cramer's two figures represent sexes of one species; and though the female is figured as *L. irenea*, that name should be retained as the older.

The range of the species is very extensive, embracing the whole of the northern portions of the continent of South America, thence spreading through Central America as far north as Guatemala; but restricted to the low forest-ground.

So far as the males are concerned there is but little variation in colour, but great diversity exists in the width of the white band common to both wings of the female.

14. *Lemonias labotas*. (Tab. XLV. figg. 8, 9.)

Lemonias labotas, Hew. Ex. Butt., *Lemonias* and *Bacotis*, ff. 1, 2¹.

Alis fuscis nigro ad basin sparsim transfasciatis, anticis maculis duabus costalibus ultra cellulam albis, angulo anali pallide cæruleo, posticis dimidio distali albo ad marginem externum cæruleo, punctis nigris submarginalibus in serie positis, angulo anali fusco; subtus pallide glaucis, anticis parte apicali fusca glauco maculata, posticis margine externo fusco maculas glaucas includente.

♀ alis fuscis, anticearum costa et marginibus exterioribus obscurioribus maculis quibusdam albis, ultra medium costæ area interna nigro maculata, posticis maculis submarginalibus albo aliquot limbatis: subtus glaucis, fascia transversa maculosa nigra, anticis margine externo late fusco, maculis duabus ad medium glaucis, aliis ad costæ medium albis, posticis ad marginem externum fusco irregulariter notatis, maculis duabus glaucis ad angulum apicalem.

Hab. NICARAGUA, Chontales (*Belt*); PANAMA¹.

Hewitson's description of this species, from which we have derived our own, was based upon a Panama example; we only possess a male which formed part of Belt's collection. These, though differing widely, we have little doubt represent sexes of one and the same species.

L. labotas has no near allies that we know of, but the male somewhat recalls *L. molina* on the upper side, though the differences are very obvious.

HAMEARIS.

Hamearis, Hübner, Verz. bek. Schmett. p. 19 (1816).

Lemonias, section *Hamearis*, Bates, Journ. Linn. Soc. Zool. ix. p. 447.

The members of this genus have usually been associated with *Apodemia*, either as a separate genus or as a section of *Lemonias*, but the presence in the primaries (*H. epulus*) of a distinct upper discocellular nervule serves to distinguish what appears to be really

a natural association of species, the most aberrant being the *H. albinus* of Felder. *Hamearis* contains eight or nine species, all strictly South American with the exception of three which just enter our limits in the State of Panama.

Compared with *Lemonias sudias* the primaries, as already stated, have an upper discocellular, the front legs of the male offer no peculiarity, the tarsus being single-jointed; the first four joints of the tarsus of the female are terminated with very strong spines; the secondary sexual organs of the male resemble somewhat those of *L. irenea*, the harpagones have four very distinct slightly incurved teeth at the extremity; besides the usual structures we find, in addition, a pair of long rods proceeding from either side of the base of the penultimate segment of the body and standing outwards as far as the end of the harpagones, and terminating in a sharp slightly decurved point. The bursa copulatrix of the female has two long thorn-like projections with granular surface and one edge irregularly serrate.

1. *Hamearis erostratus*. (*Lemonias erostratus*, Tab. XLV. figg. 6, 7.)

Lemonias erostratus, Doubl. & Hew. Gen. Diurn. Lep. p. 458, t. 71. f. 4¹.

Alis fulvis, anticis maculis transversis paucis ad basin notatis, litura transversa ultra cellulam cum margine externo conjuncta, fuscis, hoc fasciam maculosam submarginalem fulvam includente; posticis dimidio distali fusco adumbrato maculis nigris in serie submarginali positis; subtus anticis ut supra, maculis in cellula aliisque ad apicem albis; posticis fuscis dimidio basali albo, annulis fuscis dense (interdum confluentibus) notatis, annulis quoque submarginalibus albis, iis ad angulum analem et apicalem intus nigris.

♀ mari valde similis.

Hab. PANAMA, Bugaba (*Arcé*), Taboga Island (*Champion*).—COLOMBIA; VENEZUELA¹.

A somewhat variable form, individuals differing in the width of the markings of the upper surface of the wings; beneath, too, the spots of the secondaries are arranged in more definite lines in some examples than in others. We see no essential difference between our examples from Panama and Venezuela, whence the types are said to have been derived.

Mr. Champion met with this species not uncommonly on the steep rocky slopes of the island of Taboga.

2. *Hamearis domina*. (*Lemonias domina*, Tab. XLV. figg. 10, 11 ♂, 12 ♀.)

Lemonias domina, Bates, Ent. Monthl. Mag. i. p. 204¹.

Alis fulvis, anticis maculis nigricantibus sparsim notatis, margine externo late nigricante; posticis costa et margine externo coloris ejusdem, hoc lunulas fulvas includente; subtus anticis ut supra, maculis costalibus ultra cellulam aliisque submarginalibus albidis, posticis fuscis præcipue in linea mediana albo maculatis.

♀ mari similis sed alarum marginibus annulis fulvis distincte notatis, subtus fascia mediana communi venis divisa alba.

Hab. PANAMA, Veraguas (*Arcé*¹), line of railway (*M^cLeannan*), near the city (*J. J. Walker*).

The largest species of this section of the genus, and restricted, so far as we know, to the district of the Panama railway and the adjoining province of Veraguas, whence

M^cLeannan and Arcé have sent us a few specimens, and where, quite recently, Mr. J. J. Walker also found it.

The difference in the size of the spots of the primaries of individuals of this species renders it an obviously variable one; there is also great diversity in the size of the insect.

Its nearest ally is perhaps *L. aurinia*.

3. *Hamearis albinus*.

Lemonias albinus, Feld. Wien. ent. Mon. v. p. 101¹; Reise d. Nov. Lep. p. 299, t. 37. f. 1-4²; Bates, Journ. Linn. Soc. Zool. ix. p. 448³.

Anticis ad basin albis, a dimidio distali fulvo distincte divisam, litura transversa ultra cellulam fulva, extra eam maculis tribus albis, altera ad angulum analem albido-fulvo marginatis; posticis albis, costa et margine externo fuscis, hoc intus ad angulum apicalem fulvo, ad angulum analem albo-atomato et macula nigra notato; subtus fuscis ad basin rufescentibus, anticis maculis duabus infra cellulam et altera ad angulum analem nigris, maculis tribus in cellula, duabus ultra eam, litura transversa exteriori, fascia maculosa submarginali et plaga magna subtriangulari ad marginem internum albis, posticis fascia alba bisectis, margine externo et maculis magnis subcostalibus albis, macula duplici ad angulum analem nigra, altera ad angulum apicalem.

♀ mari similis sed alis pallidioribus, colore rufo fere omnino absente.

Hab. PANAMA, near the city (*Champion*), Taboga Island (*J. J. Walker*).—COLOMBIA^{2 3}; VENEZUELA^{1 2}.

This well-marked species has its nearest ally in *L. glaphyræ* of South Brazil, but it is twice as large as that insect, besides other points of difference.

It was described by Dr. Felder from specimens taken by Dr. Moritz in Venezuela, whence it has been traced to the neighbourhood of Santa Marta and Panama. Mr. Champion took it near the city, and Mr. Walker in the island of Taboga in the bay.

These western specimens differ slightly from Dr. Felder's figure, having more rufous on the upper surface of the primaries.

APODEMIA.

Apodemia, Felder, Reise d. Nov. Lep. p. 302 (1865).

Dr. Felder separated this species from *Lemonias*, placing in it certain species found in the south-western States of North America and in Northern Mexico. The number of these now amounts to seven or eight, of which six are found in our region, all of them in Northern Mexico.

The neuration of the primaries in *A. cythera* resembles that of *Lemonias*, except that the middle discocellular is much less atrophied; the costal and distal sides of the cell are subequal, the lower discocellular meets the median a long way beyond the second branch.

In the front legs of the male the trochanter is inserted some way beyond the middle of the coxa; the femur is short= $\frac{1}{2}$ coxa, slightly dilated towards its distal end;

tibia is ovoid, > femur + trochanter, first tarsal joint also ovoid, = femur, terminal joint subcylindrical, = trochanter, the terminal tarsal joint of the front leg of the female = third joint; the third and fourth joints terminate each with a pair of long spines; the first and second joints, as well as the tibia, have in addition several strong spines beneath. The palpi have a very slender terminal joint = $\frac{1}{2}$ middle joint, which is tumid.

The bursa copulatrix of the female has two sagittate chitinous patches.

Regarding *A. palmeri* and the allied species *A. hepburni* and *A. walkeri*, we can say nothing of their sexual structure as we have not sufficient materials for dissection. Their general resemblance to *A. virgulti* is obvious, and this is why we place them in this genus.

Nemeobius mexicanus, Behr, evidently an *Apodemia*, we have not been able to recognize.

1. *Apodemia cythera*.

Lemonias cythera, W. H. Edw. Trans. Am. Ent. Soc. iv. p. 345¹.

Alis testaceis marginibus externis fuscis, maculis albis nigro limbatis ad basin et serie submarginali ejusdem coloris, linea valde sinuata ultra cellulas nigra, maculas albas extus attingentibus; subtus (præsertim posticis) pallidioribus, marginibus externis haud fuscis sed fere albis nigro maculatis, ciliis alterne nigris et albis.

♀ mari similis, sed major.

Hab. NORTH AMERICA, Arizona¹.—MEXICO, Northern Sonora (*Morrison*).

A common species in Arizona and along our northern frontier, judging from the number of specimens sent us by Mr. Morrison. It is closely allied to *L. mormo* of Felder and *L. virgulti* of Behr. Mr. Strecker, indeed, treats it as identical with the last-named species, and this again as a variety of *L. mormo*. The more rufous secondaries above and their lighter colour beneath, chiefly owing to the greater size of the white spots, seem to us to sufficiently distinguish it.

2. *Apodemia virgulti*.

Nemeobius virgulti, Behr, Proc. Cal. Ac. Nat. Sc. iii. p. 178¹.

Lemonias mormo, var. *virgulti*, Strecker, Butt. & Moths N. Am. p. 104².

Apodemia sonorensis, Feld. Reise d. Nov. Lep. p. 303³.

L. cytheræ similis, sed anticis magis acutis ad basin multo fusciscentioribus; subtus posticis fuscis, maculis irregularibus albis, maculis alteris albis nigro circumcinctis ultra cellulæ medium.

Hab. NORTH AMERICA, Southern California¹, Arizona.—MEXICO, Sonora (*Lorquin*)³.

Dr. Felder described this insect under the name of *L. sonorensis* from Mexican specimens, and we have an example of Mexican origin from Mr. Bates's collection. The latter agrees with the Californian specimens sent us from the United States as *L. virgulti*. It is closely allied to *L. mormo*, but differs in having some rufous markings on the secondaries above, and the wings of the male are perhaps a little more pointed.

3. **Apodemia hypoglauca.** (*Lemonias hypoglauca*, Tab. XLV. figg. 13, 14.)

Lemonias hypoglauca, Godm. & Salv. P. Z. S. 1878, p. 367¹.

Alis griseo-fuscis, maculis nigrescentibus indutis, eis intra et infra cellulam anticarum maximis; maculis posticarum seriebus submarginalibus duabus positis, congerie irregulari intra et circa cellulæ finem; subtus albidis, maculis, in anticis obscuris, in posticis rufis, sicut supra locatis.

Hab. MEXICO¹, Huahuapam (*Hedemann, mus. Vindob.*)

We described this species from a single female specimen formerly in Mr. Druce's collection, and which we now figure. The exact locality where this was taken was not recorded, but other similar examples in the Vienna Museum were captured by Hedemann in Mexico.

Its relationship is with *L. walkeri* rather than *L. palmeri*.

4. **Apodemia palmeri.**

Lemonias palmeri, W. H. Edw. Trans. Am. Ent. Soc. iii. p. 195¹; Strecker, Butt. & Moths N. Am. p. 104².

Alis griseo-fuscis, maculis albis nigro limbatis undique notatis, ad margines externos et in dimidio posticarum costali fulvescentibus; subtus glauco-rufescentibus, maculis albis sicut supra sed majoribus, ciliis fere omnino albis.

♀ mari similis.

Hab. NORTH AMERICA, Utah^{1 2}, Arizona.—MEXICO, Northern Sonora (*Morrison*).

This species just enters our territory on its northern boundary, where Morrison procured it, and from this source our specimens were derived. The types described by Mr. Edwards were obtained by Dr. Palmer in Utah.

5. **Apodemia hepburni**, sp. nov. (Tab. XLVII. figg. 11, 12.)

L. palmeri similis, sed maculis albis plerumque evanescentibus et posticarum angulo anali magis producto.

Hab. MEXICO, Pinos Altos in Chihuahua (*Buchan-Hepburn*).

We have a single male specimen of this species, taken by Mr. Buchan-Hepburn in the above locality. It is closely allied to *L. palmeri*, differing in having the spots on the upper surface much less conspicuous, and its primaries more pointed.

6. **Apodemia walkeri**, sp. nov. (Tab. XLVII. figg. 13, 14.)

Alis fuscis, maculis pallidioribus nigro utrinque limbatis notatis, fascia maculosa per cellulas, altera submarginali, nigris; subtus glauco-albidis, sicut supra nigro notatis, ad margines exteriores rufescentibus.

Hab. MEXICO, Acapulco (*J. J. Walker*).

This species is obviously different both from *L. palmeri* and *L. hepburni*, the primaries having no well-defined spots.

The single specimen from which the description is taken is a male, and was given us by Mr. J. J. Walker, late of Her Majesty's Ship 'Kingfisher.'

POLYSTIGMA, gen. nov.

The single species of this genus is remarkable for the unusual development of the front legs of the male, which are perfect, that is to say they possess terminal claws. The fourth and fifth joints appear to be nearly fused, and the joint between the third and fourth is barely indicated. There is a spine beneath at the end of the tibia, another near the proximal end of the first tarsal joint, and another on what appears to be the fourth joint. The terminal joint of the front leg of the female is as long as the second joint, and all the tarsal joints as well as the distal end of the tibia are strongly spinous beneath. This nearly perfect structure of the front leg of the male we have not found in any other Erycinid; it, in fact, forms an exception to the definition of the family, so far as the development of the tarsi is concerned. The prolongation of the coxa beyond the trochanter joint is present, as is universally the case in this family, this and the strong development of the basal nervure of the secondaries indicate its true position beyond all doubt.

The harpagones of the male are bilobed, the lower lobe short and blunt, the upper one produced to a slightly upturned point, both of them outwardly setose. There is a piece stretching across above the penis in an arch; the penis itself is stout and decurved from its distal half, where there is a line of ten or twelve strong papillæ. The bursa copulatrix of the female has two long strong thorn-like projections, the surface of which is granular.

1. *Polystigma nais*.

Chrysophanus nais, W. H. Edw. Trans. Am. Ent. Soc. v. p. 291¹.

Lemonias nais, W. H. Edw. op. cit. ix. p. 7²; N. Am. Butt. ii. *Lemonias*, t. 1³.

Alis rufis fusco marginatis, disco nigro maculato, anticis macula costali ultra cellulam alba; subtus anticis pallide rufis nigro maculatis, posticis glaucis, nigro quoque maculatis, plaga ultra et infra cellulam lineaque submarginali rufis, ciliis alterne albis et fuscis.

♀ mari similis.

Hab. NORTH AMERICA, Southern California¹, Colorado², Arizona¹.—MEXICO, Northern Sonora (*Morrison*), Pinos Altos in Chihuahua (*Buchan-Hepburn*).

An isolated species, bearing a curious resemblance to some members of the genus *Chrysophanus*, in which genus Mr. W. H. Edwards placed the first specimens that came under his notice.

It is common in Southern Colorado, where Mr. Neumogen found it at Oak Creek Cañon in the months of July and August.

Most of our specimens were taken by Mr. Morrison in Arizona and the adjoining portions of Sonora. Mr. Buchan-Hepburn took a single female at Pinos Altos in the State of Chihuahua.

NYMPHIDIUM.

Nymphidium, Illiger, Mag. vi. p. 286 (1807) ; Westwood, Gen. Diurn. Lep. p. 447 (1851).

This genus comprises about seventy species, ranging throughout Tropical America from Mexico to South Brazil; of these, nineteen are found in Central America, the numbers gradually increasing as we approach the southern continent, three species being found in Mexico, seven in Guatemala, and no less than thirteen in the State of Panama. Six out of the nineteen species extend their range into the southern continent, leaving thirteen peculiar to our country.

The subcostal nervure in the primaries of *N. molpe* emits two branches before the end of the cell and one after it; there is a very short upper discocellular, the atrophied middle discocellular meeting the radial close to its junction with the subcostal; the lower discocellular is also atrophied, and meets the median a little beyond the second branch; the costal side of the cell is a little longer than the median side. The secondaries have a basal nervure; both discocellulars are atrophied, the upper one meets the subcostal a little beyond the first branch, the lower the median a little beyond the second branch; the costal side of the cell is shorter than the median side.

The front legs of the male of *N. lycorias* have the trochanter inserted beyond the middle of the coxa, femur= $\frac{1}{2}$ coxa, tibia=coxa, tarsus=tibia. The terminal joint of the tarsus of the female (*N. molpe*) is the same length as the second joint, and all except the last terminate in a spine. The palpi have the terminal joint longer in the female than in the male, $>\frac{1}{3}$ middle joint; the antennæ have forty-five joints, and terminate in a very slender club.

The harpagones in the secondary sexual organs of the male consist of two long slightly depressed spines, the lower slightly setose, except at the distal end, the upper setose near its distal end; there is a large patch on either side near the base of the harpagones of long setæ. The penis is decurved and stout, and the usual strap runs from its base to the base of the harpagones. The bursa copulatrix of the female has a pair of thin projections strongly serrate along one edge, and granular towards their base. In *N. lycorias* the harpagones of the male differ widely from those of *N. molpe*, being lobes with a vertical outer edge, slightly dentate, and terminating at the upper angle with a flattened elongate projection bearing at its end several well-defined papillæ.

a. Sexes dissimilar.

1. *Nymphidium mycone*.

Nymphidium mycone, Hew. Ex. Butt., Nymphidium, t. 3. ff. 16, 17, 18¹; Bates, Journ. Linn. Soc. Zool. ix. p. 451².

Alis brunneis maculis ad basin et lituris duabus submarginalibus saturatioribus, inter has fascia fusca albido

extus limbata, posticis fasciola altera simili marginem externum propiore; subtus griseo-albidis fusco ut supra notatis, posticis maculis submarginalibus nigris, iis ad angulum apicalem maximis.

♀ plaga elliptica communi alba, in pagina inferiori quoque obvia distinguenda.

Hab. MEXICO, Valladolid in Yucatan (*Gaumer*); GUATEMALA, Polochic valley (*Hague*); HONDURAS, San Pedro (*G. M. Whitely*); NICARAGUA ^{1 2} (*Bridges*), Chontales (*Belt*); PANAMA, Volcan de Chiriqui (*Champion*), Calobre (*Arcé*).

Hewitson described this species from Nicaraguan specimens; whence we also have examples, and have traced it northwards to Mexico and southwards to the State of Panama.

The great dissimilarity between the sexes is one of its chief characteristics. The male is not unlike that of *N. orestes*, while the female has a general resemblance to that of *N. calyce*, as Hewitson has already suggested.

2. *Nymphidium præclarum*. (Tab. XLV. fig. 15.)

Nymphidium præclarum, Bates, Ent. Monthl. Mag. iii. p. 156¹; Journ. Linn. Soc. Zool. ix. p. 451².

Alis stramineis (interdum albis), anticis ad basin fuscis annulis stramineis notatis, apice et margine externo fuscis, lineam submarginalem maculosam stramineam includente; posticis ad basin fuscis, lituris duabus submarginalibus venis pallidis divisio coloris ejusdem, interiori ad angulum analem plus minusve interrupta.

Hab. PANAMA (*M. Leannan* ^{1 2}), Tolé, San Miguel in the Pearl Islands (*Champion*).—COLOMBIA.

A single female specimen sent us from Panama formed the basis of Mr. Bates's description of this species. We have since acquired three other examples from our region, including two from the Pearl Islands. These latter are smaller than the type, and the submarginal bands of the secondaries are broken up into definite spots; we have also two from the west coast of Colombia sent us by Dr. Staudinger, in these the bands of the secondaries are entire. All these six specimens are females, and as yet the male remains unknown to us. This, from analogy, should resemble that sex of *N. apame* of the Amazons valley. We have further to note regarding the females of *N. præclarum* that there appear to be two styles of coloration; the yellow of the type being as often as not replaced by white.

We have one specimen of each variety from the mainland, from the Pearl Islands, and from Colombia.

It frequents open second-growth woods of the low country (*Champion*).

3. *Nymphidium labdacus*, sp. nov. (Tab. XLVII. fig. 17.)

Alis lactescenti-albis, anticis ad basin griseo-fuscis annulis griseis notatis, apice et margine externo fuscis fere immaculatis, posticis maculis ad angulum apicalem et margine externo ipso nigricantibus; subtus fere omnino albidis, anticis ad angulum apicalem et marginem externum vix adumbratis, posticis maculis duabus ad angulum analem, duabus ulterius angulum apicalem versus fuscis.

♂ ignotus.

Hab. GUATEMALA, Telemán (*Champion*).

A single female specimen taken by Mr. Champion at Teleman in the Polochic valley is the only one we have seen of this fine species. In size and pattern it resembles the insect figured by Hewitson as *N. ethelinda* from Brazil. On the strength of this resemblance, we place the species in this section of the genus.

4. **Nymphidium laius**, sp. nov. (Tab. XLVII. fig. 15, 16.)

Alis nigricanti-fuscis, posticis præter basin, costam et angulum apicalem, flavescens; subtus anticis pallidioribus, ad basin et marginem externum flavido atomatis, maculis inter et infra cellulam ad finem ejus, ultra eam in fascia sinuosa et serie submarginali nigricantibus, posticis maculis quibusdam costalibus tribus ad angulum apicalem et una ad angulum analem coloris ejusdem.

♀ ignota.

Hab. GUATEMALA, Sinanja (*Champion*).

A single male specimen represents this fine species in our collection. This was also one of Mr. Champion's captures, who found it in the low hot wooded valley of the river Sinanja, a tributary of the Polochic. It bears a general resemblance to the male of *N. ethelinda* of Hewitson, and it is just possible that *N. laius* and *N. labdacus* are sexes of one species; but the difference in size and colour is so great that, notwithstanding Hewitson's opinion with regard to *N. ethelinda*, we hesitate to place them together without further evidence.

5. **Nymphidium clearista**.

Emesis clearista, Butler, Ann. Mag. Nat. Hist. ser. 4, viii. p. 283¹.

♀ alis albis, anticarum margine costali (cellula inclusa) et margine externo rufescentibus, maculis obscuris tribus in cellula, posticis angulo anali rufescenti; subtus ut supra sed marginibus pallidioribus, posticis maculis sparsissimis et maculis indistinctis submarginalibus notatis, abdomine albo.

Hab. HONDURAS (*Dyson*¹, *Mus. Brit.*)

This species is only known from a single specimen in the British Museum, said to have been obtained by Dyson in Honduras.

We have placed it provisionally in this section of the genus, but its true position can only be ascertained when the male is known.

b. Sexes similar.

a'. Anal angle of secondaries rounded.

6. **Nymphidium dorilis**. (Tab. XLV. fig. 16.)

Nymphidium dorilis, Bates, Ent. Month. Mag. iii. p. 156¹; Journ. Linn. Soc. Zool. ix. p. 451².

Alis rufo-brunneis, fascia communi lata, annulis submarginalibus aliisque inter et infra anticarum cellulam fulvis; subtus pallide fuscis sordide albo ut supra notatis.

♀ adhuc ignota.

Hab. PANAMA, Lion Hill (*M^cLeannan*^{1 2}).—COLOMBIA.

The single male specimen, from which Mr. Bates's description was drawn, is still the only one we have received from our country; but Dr. Staudinger sent us another male from Colombia, which only differs from our type by the greater extension of the fulvous band to the costa of the primaries.

It is a well-marked species, and perhaps most nearly allied to *N. gela*, as Mr. Bates pointed out.

7. *Nymphidium molpe*.

Limnas subtilis molpe, Hübn. Samml. ex. Schmett. i. t. 31¹.

Nymphidium molpe, Bates, Journ. Linn. Soc. Zool. ix. p. 451².

Nymphidium azanoides, Butl. Ent. Month. Mag. iii. p. 221³.

Nymphidium ascolia, Butl. & Druce, P. Z. S. 1874, p. 354⁴.

Alis fusco-nigricantibus, annulis inter et infra cellulam griseis, maculis submarginalibus nigris griseo circumcinctis in posticis fere confluentibus, litura submarginali intra eas rufescente, fascia communi lata (in anticis subtriangulari) alba; subtus multo pallidioribus sed eodem modo notatis, maculis submarginalibus posticarum magis obviis et colore rufescente nullo.

♀ mari similis sed plaga anticarum alba multo minus acuta, anticarum costa angustiore fusca.

Hab. MEXICO, Valladolid in Yucatan (*Gaumer*); BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, Polochic valley, Chisoy, Choctum (*Hague*), Toco, Chiacam, Panima, Panzos, Telemán, Chacoj (*Champion*); NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*⁴); PANAMA, Calobre (*Arcé*), Lion Hill (*McLeannan*), San Miguel in the Pearl Islands (*Champion*).—SOUTH AMERICA, Colombia to Guiana and the Amazons valley².

The variation in the size of this species is considerable, but the average of those from Central America is much less than that of the southern examples, but mingled with large southern specimens are others with dimensions no greater than our Central American insects.

N. molpe is one of the most abundant species of the genus in Central America, being found chiefly in the low-lying country up to an elevation of 3000 feet.

8. *Nymphidium lamis*.

Papilio lamis, Cram. Pap. Ex. t. 335. F, G¹.

Alis fuscis, fascia communi (in anticis triangulari) alba, lineolis intra cellulam anticarum, semicirculisque submarginalibus griseo-cæruleis et intra eos litura rufa; subtus ut supra, semicirculis intus aut nigris aut albis, punctis quibusdam nigris albo circumcinctis ad basin.

♀ mari similis.

Hab. PANAMA, Veraguas (*Arcé*).—GUIANA¹.

We have only a single female specimen of this species from our region, which, however, agrees so closely with others from Guiana as to leave no reasonable doubt as to their identity.

We have no specimens from intermediate localities, but we have some doubts as to the distinctness of *N. lysimon* of Stoll, which Mr. Bates traces throughout the Amazons valley. Should they prove inseparable, the interval in the range of the species becomes in a great measure filled up.

9. *Nymphidium onæum*.

Nymphidium onæum, Hew. Ex. Butl., *Nymphidium*, t. 4. ff. 27, 28¹.

Alis albis fusco marginatis, anticis maculis inter et infra cellulam (griseo vix marginatis) nigris, semicirculis submarginalibus griseis. cellula anticarum et parte infra eam (maculis nigris exceptis), plagaque ad angulos alarum ambarum anales, rufis; subtus ut supra sed marginibus pallidioribus et magis distincte notatis.

♀ mari similis.

Hab. NICARAGUA, Chontales¹ (*Belt*); COSTA RICA, Cache (*Rogers*); PANAMA, Veraguas (*Arcé*).

This species was described by Hewitson from Nicaragua specimens, whence we also have examples. In Costa Rica it appears to be abundant, but further south it becomes rare, as we have only a single example from the State of Panama contained in one of Arcé's collections. In South America there are several allied species, of which, perhaps, *N. caricæ* is most nearly allied, but in that insect there is a submarginal rufous band in both wings, which in *N. onæum* is restricted to the anal angle.

10. *Nymphidium hæmatostictum*. (Tab. XLVI. figg. 1, 2.)

Nymphidium hæmatostictum, Godm. & Salv. P. Z. S. 1878, p. 367¹.

Anticarum costa et margine externo nigricante-brunneis, plaga triangulari, macula ad apicem et posticis intus omnino albis; maculis submarginalibus nigris utrinque lineolis angustis undulatis cærulescente-griseo marginatis, anticarum margine bitriente ab angulo anali introrsum rubro, aliter et margine angusto brunneis; subtus marginibus ut supra sed linea irregulari intima maculos submarginales nigros circumcinctibus fere alba, anticis maculis irregularibus duabus in margine exteriori, una media et altera angulum analem prope, rubore anticarum magis restricto.

Hab. PANAMA (*Ribbe*¹, *mus. Staudinger*).

We described this species from a single specimen in Dr. Staudinger's collection. Its nearest ally is *N. chimborazia* of Western Ecuador.

11. *Nymphidium olinda*.

Nymphidium olinda, Bates, Ent. Month. Mag. i. p. 204¹; Journ. Linn. Soc. Zool. ix. p. 453².

Alis fuscis fascia communi alba, anticis annulis inter et infra cellulam griseo-cæruleis, semicirculis in margine externo coloris ejusdem, posticis margine externo ipso albo deinde cærulescente, lineis semiovalibus griseo-cæruleis; subtus pallidioribus lineis omnibus latioribus albis (nec cærulescentibus).

Hab. PANAMA^{1 2}, Bugaba (*Champion*).—AMAZONS VALLEY^{1 2}.

This species must be rare in our district, for, although Dr. Staudinger has one specimen from Chiriqui and Mr. Champion also took one at Bugaba, we have no other

evidence of its presence in the State of Panama, except that one of Mr. Bates's types came from there. In the Amazons valley it is more common.

Mr. Bates places the species between the beautiful *N. mantus* and *N. baotia*, the former of which occurs just beyond our limits at Santa Marta in Colombia.

12. *Nymphidium sicyon*. (Tab. XLVI. fig. 4.)

Nymphidium sicyon, Godm. & Salv. P. Z. S. 1878, p. 368¹.

Alis stramineis, marginibus externis et anticarum costa nigricantibus, posticis margine externo lineas duas stramineas includente, area inter eas nigro maculata; subtus pallidioribus, posticis margine externo ut supra maculatis haud lineatis.

♀ nobis ignota.

Hab. GUATEMALA, Polochic valley¹ (*Hague*).

Our type, described by us in 1878, is still the only specimen in our collection. We formerly compared it with *N. agle*, but are now disposed to consider *N. ochra* a nearer ally. From it *N. sicyon* can readily be distinguished by the absence of the narrow yellow band which runs parallel to the outer margin of the primaries.

13. *Nymphidium ascolia*.

Nymphidium ascolia, Hew. Ex. Butt., *Nymphidium*, t. 1. f. 4¹.

Desmozona ascolides, Boisd. Lép. Guat. p. 21².

Alis pallide primulinis fusco marginatis, semicirculis serie submarginalibus tenuissimis grisco-albidis, posticis macula ad angulum analem rufa; subtus fere ut supra, sed anticis in cellula lineis transversis griscis, in marginem externum maculis quibusdam albis notatis; abdomine medialiter primulino.

♀ mari similis.

Hab. GUATEMALA², Polochic valley (*Hague*), Cahabon, Panzos (*Champion*); NICARAGUA, Chontales (*Belt, Janson*); PANAMA, Volcan de Chiriqui (*Champion*), Veraguas (*Arcé*), Lion Hill (*M-Leannan*).—SOUTH AMERICA, Colombia to Amazons valley¹.

Nymphidium ascolia was described by Hewitson from the Amazons valley, and examples in Mr. Bates's collection are doubtless typical; these, as well as the figure, have a broader dark margin to the wings than is usual in Central American insects, but in the absence of other characters we are not disposed to separate them solely on this account.

N. ascolia may easily be confounded with *N. cachrus* of Fabricius, but the light-coloured abdomen of the former, as contrasted with the dark one of the latter, seems a character by which they may be distinguished.

We have a considerable series of specimens from our region, ranging between Guatemala and Panama, with the exception of Costa Rica*.

* The specimen from Van Patten's collection called *N. ascolia* by Messrs. Butler and Druce should be called *N. molpe*.

The type of *Desmozona ascolides*, Boisd., which, through Mons. C. Oberthür's kindness, we have examined, agrees with our Central American series, and this name can be used for it should its separation from *N. ascolia* hereafter be deemed advisable.

14. **Nymphidium ipsea**, sp. nov. (Tab. XLV. figg. 17, 18.)

Alis fuscis plaga lata communi costam anticarum haud attingente flavida, inter et infra cellulam annulis evanescentibus aliisque ad marginem externum coloris ejusdem; subtus ut supra sed omnino dilutioribus annulisque omnibus magis distinctis.

Hab. NICARAGUA, Chontales (*Belt*).

At present we know of but a single female example of this species, taken by Mr. Belt in Nicaragua. It has a general resemblance to that sex of *N. molpe*, but the inner area of the wing is yellowish and not white, and there is no rufous in the outer border of the secondaries.

15. **Nymphidium ictericum**. (Tab. XLVI. fig. 3.)

Nymphidium ictericum, Godm. & Salv. P.Z. S. 1878, p. 367¹.

Alis ad basin ochraceo-brunneis; anticis fascia lata obliqua, ad medium constricta, a costa marginem externum versus eunte, macula irregulari in margine interno aliisque quibusdam prope marginem externum, posticisque omnino, ochraceo-flavis; anticis lineis indistinctis obscuris cellulam transeuntibus; subtus ut supra sed alis pallidioribus.

♀ mari similis sed omnino pallidior.

Hab. PANAMA, Veraguas (*Arcé*¹), Chiriqui (*Ribbe*¹).

A peculiar species of which, as yet, we have only seen two specimens; one, a male, taken by Arcé, which is in our collection, the other, a female, which is in that of Dr. Staudinger.

16. **Nymphidium nycteus**, sp. nov. (Tab. XLVII. fig. 18.)

Alis albis, anticis fascia mediana longitudinali rufo-brunnea, maculis tribus transversis in cellulam duabusque infra eam nigris, margine externo nigricante maculas sex submarginales albas includente, ea ad angulum analem maxima, posticis ad basin et macula duplici ad angulum apicalem nigris; subtus fere omnino albis, anticis ad apicem et macula ad medium marginis externi fusciscentibus albido variegatis, posticis macula duplici ad angulum analem nigra.

♂ adhuc ignotus.

Hab. PANAMA, Bugaba (*Champion*).

We can suggest no near ally to this species, one of the largest and most striking of the genus.

It is only known to us through a single female specimen forwarded by Mr. Champion from Bugaba in the State of Panama.

b'. Anal angle of secondaries produced.

17. *Nymphidium velabrum*. (Tab. XLV. figg. 19, 20.)

Nymphidium velabrum, Godm. & Salv. P. Z. S. 1878, p. 368 ¹.

Alis nigricante-fuscis fascia communi alba a cellulae anticarum fine alba, ultra eam macula subquadrata costam anticarum attingente et angulo posticarum anali fulvis, maculis his duabus linea angustissima ejusdem coloris conjunctis, extra eam fasciis duabus pallidis marginibus externis propioribus, anticis annulis inter et infra cellulam indistincte griseis; subtus ut supra sed omnino grisescentioribus, annulis anticarum cellularibus et fasciis submarginalibus magis distinctis.

♀ mari similis.

Hab. PANAMA, Calobre (*Arcé* ¹).

This species is only known to us from three rather damaged specimens sent us by Arcé from Calobre, its range, therefore, probably is very limited. Though obviously distinct, it is manifestly allied to *N. phliassus* of Guiana. Their differences can be best expressed by stating that, whereas the latter bears a superficial resemblance to *Adelpha cocala*, *N. velabrum* takes the pattern of *A. iphicla*.

18. *Nymphidium lycorias*.

Nymphidium lycorias, Hew. Ex. Butt., *Nymphidium*, t. 1. ff. 7, 8 ¹; Bates, Journ. Linn. Soc. Zool. ix. p. 452 ².

Alis fuscis plaga communi subovali margines haud attingente, anticis macula subapicali altera infra eam, posticis lineis duabus submarginalibus, ea interiori multo latiore, albis, anticarum teetricibus, maculis tribus cellularibus, macula ad angulum analem et posticis regione anali rufis, hac macula nigra notata; subtus ut supra, fasciis submarginalibus omnino latioribus, anticis litura longitudinali cellulari alba, maculis rufis absentibus; posticis ad basin albis.

♀ mari similis sed anticis macula ad angulum analem alba.

Hab. MEXICO, Mazatlan (*Forrer*), Oaxaca (*Deppe*), Cordova (*Rümeli*); GUATEMALA ², Polochic valley (*Hague*), San Gerónimo (*Champion*); HONDURAS ^{1 2} (*Mus. Brit.*).

Though formally described by Hewitson from specimens said to have been taken in Honduras, an example had previously remained undescribed in the Berlin Museum for upwards of twenty years. It formed part of the rich collection made by Deppe in Mexico. In the latter country it appears to be not uncommon, and we have traced it as far north as Mazatlan. In Guatemala it is locally distributed, but not uncommon in open second-growth woods, at San Gerónimo 3000 feet above the sea, and is also found in the valley of the Polochic. Southward of Honduras its place is taken by the next species, *N. adelphinum*, a very close ally.

19. *Nymphidium adelphinum*.

Nymphidium adelphinum, Godm. & Salv. P. Z. S. 1878 ¹.

Nymphidium lycorias, Butl. & Druce, P. Z. S. 1874, p. 354 ².

N. lycorias, simile posticis fascia alba interiori marginis externi fere obsoleta, macula alba ad apicem anticarum multo minore, vix distinguendum.

Hab. NICARAGUA, Chontales (*Belt*); COSTA RICA (*Van Patten*¹), Cache (*Rogers*); PANAMA, Calobre (*Arcé*).

This insect is a southern race of *N. lycorias*, taking its place in Nicaragua and extending its range to Panama. It is common in Costa Rica, and occurs again in Calobre in the State of Panama, but we have no specimens from the district of Chiriqui, which is somewhat remarkable. In Western Colombia there is a still more modified form which we describe below*.

PANDEMOS.

Pandemos, Hübner, Verz. bek. Schmett. p. 25 (1816); Westwood, Gen. Diurn. Lep. p. 440 (1851).

We are acquainted with but four species belonging to this genus, three of which are known only from single specimens; the fourth is *P. arcas*, the type of the genus which we here describe. Two species occur within our limits.

The subcostal nervure of the primaries emits two branches before the end of the cell and one after it; both the lower and middle discocellulars are atrophied, the upper meets the subcostal at the same point as the upper radial, the lower the median beyond the second branch; the costal side of the cell is a little longer than the median; there is a large patch of thickly felted scales below the junction of the median and its first branch. The secondaries have a basal nervure, both discocellulars are atrophied, the upper meets the subcostal a little beyond the first branch, the lower the median nearly opposite the second branch; the costal side of the cell is a little shorter than the median; there is a patch of thickly felted scales between the costal and subcostal nervures corresponding to the similar patch on the primaries. In the female these patches are absent.

The front legs of the male have the trochanter inserted beyond the middle of the coxa; femur $> \frac{1}{2}$ coxa, ovoid and dilated towards its distal end; tibia $<$ coxa; tarsus $> \frac{3}{4}$ tibia, two-jointed, with a constriction in the terminal joint, the remnant of an atrophied third joint. The terminal joint of the palpi in the male are long and slender, $= \frac{1}{4}$ middle joint; that of the female is much longer, $= \frac{2}{3}$ middle joint. The antennæ have fifty-four joints, the terminal seventeen forming a slender club.

The harpagones of the male in the secondary sexual organs are subtriangular, the apex being a simple lobe slightly setose; a short rod proceeds from the base of the harpagones in the middle line, and the strap passes from the middle of the penis to the base of the harpagones. The penis itself gradually tapers, and is decurved throughout its length.

* *Nymphidium germanus*, sp. n.

L. lycorias similis sed plaga alarum communi angusta margine externo nigricante latissimo, fascia submarginali interiori angusta et fusco atomata, subtus maculis omnibus albis submarginalibus distinctissimis.

Hab. COLOMBIA, Rio San Juan (*Trötsch*).

1. *Pandemos nymphidioides*. (Tab. XLVI. figg. 5, 6.)

Pandemos nymphidioides, Butl. Cist. Ent. i. p. 79¹; Butl. & Druce, P. Z. S. 1874, p. 354².

Alis anticis rufescenti-brunneis, maculis intra et infra cellulam saturatioribus, maculis tribus inter ramos medianos, posticis (præter basin et angulum analem) pallide ochraceis; subtus sordide albis, anticis extus pallide fusco-nebulosis, maculis tribus ad angulum posticarum analem fuscis.

Hab. COSTA RICA (*Van Patten* ^{1 2}).

The single male specimen described by Mr. Butler is the only one which has yet reached us; though its coloration suggests that *Nymphidium* is the genus in which it ought to be included we are in little doubt that it was rightly placed by Mr. Butler in *Pandemos*. We note, however, that the peculiar patches on the wings of *P. arcas* are absent in this species, and it is possible that closer dissection may reveal other differences.

2. *Pandemos godmanni*.

Pandemos godmanni, Dewitz, Mitth. Münch. Ent. Ver. i. p. 90, t. 2. f. 7¹.

Alis anticis apicibus aculeatis, margine externo apicem versus inciso, margine interno arcuato, posticis elongatis et rotundatis. Anticis rufo-brunneis, fascia ultra cellulam arcuata a costa fere ad angulum analem extendente alba, introrsum pallide lilacinis; posticis violaceis, marginibus fuscis; subtus sordide griseis, anticis fascia alba paginæ superioris latiore et plaga magna intra eam usque ad basin (præter costam) extendente, nigra.

Hab. MEXICO, Vera Cruz (*Deppe* ¹).

This species is alone known to us from the single male example in the Berlin Museum obtained by Deppe at Vera Cruz in Mexico, and described and figured by Dr. H. Dewitz in the "Mittheilungen des Münchener entomologischen Vereins" in 1877, and placed by him in the genus *Pandemos*. Whether it really belongs to this genus or not it is impossible to say, as the shape of the wings is abnormal, and the figure does not show the projecting palpi; moreover, the neuration of the front wings is evidently not drawn with exactitude. Our description was compiled from Dr. Dewitz's figure.

ARICORIS.

Aricoris, Westwood, Gen. Diurn. Lep. p. 449 (1851).

We are acquainted with fifteen species belonging to this genus, which extends from Nicaragua southwards to the Amazons valley and Guiana, two only entering our country.

The subcostal nervure of the primaries in *A. jansoni* emits two branches before and one after the end of the cell; the discocellulars are only partially atrophied, and both of them convex; the middle discocellular meets the subcostal at the same point as the upper radial, the lower the median a little beyond the second branch; the costal side of the cell is a little longer than the median side. The secondaries have a basal nervure;

both discocellulars are atrophied, the upper meets the subcostal some way beyond the first branch, the lower the median a little beyond the second branch; the costal side of the cell is shorter than the median side.

The terminal joint of the palpi is long and slender, $=\frac{1}{4}$ middle joint; the antennæ have forty-seven joints, and terminate in a slender club.

The harpagonès in the male secondary sexual organs are simple lobes pointed outwards, and are setose on the upper and lower regions, as well as towards the point; the penis is short, slightly tapering and decurved throughout its length, and the usual strap proceeds from its middle to the base of the harpagones.

1. *Aricoris jansoni*.

Aricoris jansoni, Butl. Cist. Ent. i. p. 31¹; Lep. Ex. p. 41, t. 14. f. 5².

Alis purpurecente-cæruleis, costis et angulis apicalibus nigricantibus, macula bifida ad medium rami mediani secundi alba; subtus fuscis extus inter venas albidis, ad basin quoque albo notatis.

♀ mari similis, sed anticis ad basin et area posticarum interna tantum cærulescentibus, anticis fascia lata ultra cellulam a costa fere ad angulum analem ochracea; subtus multo pallidioribus colore cæruleo nullo, posticis maculis submarginalibus indistinctis albidis.

Hab. NICARAGUA, Chontales (*Belt, Janson*¹); COSTA RICA, Cache (*Rogers*); PANAMA, Volcan de Chiriqui, Bugaba (*Champion*).—COLOMBIA.

This is not an uncommon species in Nicaragua, and thence along the isthmus to Panama. In the former country it was obtained in some numbers by the late E. M. Janson, after whom Mr. Butler named it. The nearest South American ally is *A. lagus*, from the female of which it seems constantly to differ in having the wings suffused with blue.

Frequents second-growth woods and forest margins up to 3000 feet (*Champion*).

2. *Aricoris cleomedes*.

Aricoris cleomedes, Hew. Ent. Month. Mag. vii. p. 4¹; Ex. Butt., Erycina, Symmachia, &c. f. 11².

Alis aurantiis, costis et marginibus externis nigricantibus, anticis maculis tribus subapicalibus albidis; subtus omnino pallidioribus, posticarum costa aurantia, maculis submarginalibus albidis.

♀ mari similis, sed alis pallidioribus, posticarum costa haud nigricante.

Hab. NICARAGUA, Chontales (*Belt*^{1 2}).

The only collector who has as yet met with this species is Belt, and he obtained several examples, some of which are now in our possession. Its position in the genus of *Aricoris* is open to question as the similarity of the sexes is an exceptional feature; but until we have material for dissection we leave it where Hewitson placed it.

THEOPE.

Theope, Westwood, Gen. Diurn. Lep. p. 439 (1851).

This singular genus, many members of which bear such a strong resemblance to

Lycænidae, contains at least fifty species ranging through Tropical America from Mexico southwards, the majority of the species congregating in the valley of the Amazons and on the eastern slopes of the Andes. We at present know of fourteen species as inhabiting our own country.

The subcostal nervure of the primaries in *T. eudocia* emits two branches before the end of the cell and one after it; the first branch anchyloses for a short distance with the costal; the lower and middle discocellulars are both atrophied, the latter meets the upper radial some way beyond its junction with the subcostal, so that there is a well-defined upper discocellular; the lower discocellular meets the median a little beyond the second branch; the costal side of the cell is shorter than the median side. The secondaries have a well-defined straight basal nervure; the lower and upper discocellulars are both atrophied, the latter meets the subcostal beyond the first branch, the former the median beyond the second branch; the costal and median sides of the cell are nearly equal.

The front legs of the male have the trochanter inserted about the middle of the coxa, the femur $< \frac{1}{2}$ coxa, dilated towards its distal end, tibia $> \frac{1}{2}$ coxa, tarsus = femur + trochanter. The terminal joint of the tarsus of the female = second joint, and has a setose pad beneath; the second, third, and fourth joints terminate with a strong spine.

The palpi are long and slender; those of the male = $\frac{1}{2}$ middle joint; those of the female are still longer, being a little shorter than the middle joint.

The secondary sexual organs in the male have bilobed harpagones, the lower obtuse, the upper pointed and slightly depressed, and both setose; a long rod proceeds from the base of the harpagones in the middle line, and is pointed and slightly upturned towards its end; the penis is strong and curved downwards towards its base, and the usual strap proceeds from its middle to the base of the harpagones.

a. Wings uniform beneath, no spots near the anal angle of the secondaries.

a'. Secondaries orange above.

1. *Theope eudocia*. (Tab. XLVI, figg. 10, 11 ♂, 12 ♀.)

Theope eudocia, West. in Doubl. & Hew. Gen. Diurn. Lep. p. 439, t. 70. f. 4¹; Bates, Journ. Linn. Soc. Zool. ix. p. 453².

Alis antieis nigricantibus, plaga subapicali violacea, altera magna cellulæ dimidium et marginem internum totum amplexante posticisquo omnino saturate croceis; subtus omnino saturate citrinis.

♀ mari similis sed colore anticarum nigricante magis restricta et plaga violacea nulla.

Hab. NICARAGUA, Chontales (*Belt*).—SOUTH AMERICA, Venezuela to Bolivia, Amazons valley^{1 2}, and Guiana.

This is a peculiar species, being the only one of the genus in which the orange yellow colour predominates on the upper surface. Its range is wide, and includes the whole of the Amazons valley, and thence northward to the sea; in Central America it is only known to us from Nicaragua.

b. Secondaries blue above.

a". Wings orange or yellow beneath.

2. *Theope hypoxanthe*. (Tab. XLVII. figg. 21, 22.)

Theope hypoxanthe, Bates, Journ. Linn. Soc. Zool. ix. p. 405¹.

Alis supra violaceo-cæruleis, anticarum costa apice et margine externo lato nigris, posticis margine externo quoque nigro; subtus omnino læte aurantiacis.

♀ mari similis sed colore cæruleo anticarum magis restricto, posticis dimidio costali nigricanti-fusco.

Hab. PANAMA, Bugaba (*Champion*).—AMAZONS VALLEY¹ and GUIANA.

Two specimens from the State of Panama we are unable to separate from Mr. Bates's types from the Amazons valley; we have not yet met with the species from any intermediate locality.

Low forest region west of Bugaba (*Champion*).

3. *Theope isia*. (Tab. XLVI. figg. 20, 21.)

Theope isia, Godm. & Salv. P. Z. S. 1878, p. 368¹.

Precedenti similis sed alis magis cærulescentibus haud violaceis, subtus pallidius aurantiacis.

♀ ignota.

Hab. MEXICO, Atayac (*Hedemann, mus. Vindot*); GUATEMALA, Polochic valley (*Hague*¹).

A single specimen only of this species is in our collection, sent us by Mr. Hague from Guatemala. We have seen one other in the Vienna Museum taken by Hedemann at Atayac in Southern Mexico.

It is closely related to *T. pedias* and *T. hypoxanthe*, differing from both in its much paler under surface.

4. *Theope cænina*.

Theope cænina, Godm. & Salv. P. Z. S. 1878, p. 369¹.

Alis anticis fuscis, cellula fere ad finem, margine interno et posticis omnino, purpureo-cyaneis; subtus lividis.

♀ ignota.

Hab. PANAMA, Chiriqui (*Ribbe*¹).

This is only known to us from a single specimen which formed part of Herr Ribbe's collection from Chiriqui. The under side is of a very pale yellow.

5. *Theope barea*. (Tab. XLVI. figg. 13, 14 ♂, 15 ♀.)

Theope barea, Godm. & Salv. P. Z. S. 1878, p. 369¹.

Precedenti similis sed anticis plaga ultra cellulam sericea, subtus paulo flavescientioribus.

Hab. HONDURAS (*Mus. Brit.*); PANAMA, Veraguas (*Arcé*¹), Chiriqui (*Ribbe*¹).—COLOMBIA.

Our type of this species was sent us from Veraguas by our collector Arcé, and we have since received two others from Western Colombia; it has no very near allies, but the silky spot on the disc of the primaries suggests the relationship with *T. aureocincta*.

b". Wings grey beneath.

6. *Theope thootes*.

Theope thootes, Hew. Exot. Butt., Theope, ff. 9, 10¹; Bates, Journ. Linn. Soc. Zool. ix. p. 454².

Anticis nigricantibus, cellula et infra eam ad marginem internum, posticisque omnino, læte cæruleis, subtus fusciscentibus.

♀ mari similis sed colore anticarum cyaneo magis extenso et extus bifurcato, subtus anticis paullo saturatioribus.

Hab. NICARAGUA, Chontales (*Belt*).—AMAZONS VALLEY ¹².

We have a single male specimen from Nicaragua which agrees with our series from the Amazons, the country of the true *T. thootes*. The anal angle of the secondaries is rounded, and there are no spots in this region. These characters separate *T. thootes* from *T. theutis*, a species we have long confounded with it.

b. Wings beneath with spots near the anal angle of secondaries, or crossed with a common dark band.

c'. Secondaries beneath with spots near the anal angle.

7. *Theope theutis*, sp. nov. (*T. thootes*, Tab. XLVI. figg. 16, 17 *.)

T. thootei similis sed alis subtus paullo saturatioribus, posticis angulo anali magis producto haud rotundato maculisque minutis interdum fere obsoletis notato.

Hab. GUATEMALA, Polochic valley (*Hague*); NICARAGUA, Chontales (*Belt*).

We have a single female specimen of this species from Guatemala, and a male and two females from Nicaragua. At first sight it may readily be mistaken for *T. thootes*, but the points given above fairly distinguish it.

8. *Theope folia*, sp. n. (Tab. XLVII. figg. 23, 24.)

Precedenti similis, sed anticis magis acutis, costa magis sinuosa, colore cyaneo magis nitente; subtus cinereo-fuscis, extus pallidioribus.

♀ nobis ignota.

Hab. PANAMA, Peña Blanca (*Champion*).

There is a specimen in the British Museum, said to be from Rio Janeiro, but the name of the collector has not been recorded. Our type is the only one captured by Mr. Champion during his recent journey.

9. *Theope herta*, sp. n. (Tab. XLVII. figg. 25, 26.)

Alis fuscis ad basin cæruleo atomatis; subtus sericeo-murinis, maculis parvis ad angulum posticarum analem.

Hab. PANAMA, Bugaba (*Champion*).

This species rests upon a single example obtained by Mr. Champion. It has no near

* These figures are erroneously marked on the Plate as 16♂, 17♀; they refer to the upper and under side of the same insect, a female of *T. theutis*.

allies that we are acquainted with, and is distinguished by its dark colour with a few blue scales towards the base of the wings.

10. **Theope virgilius.** (Tab. XLVI. figg. 7, 8.)

Hesperia virgilius, Fabr. Ent. Syst. iii. p. 323¹.

Theope virgilius, Bates, Journ. Linn. Soc. Zool. ix. p. 455².

Alis nigris, dimidio basali præter costam et posticis omnino cæruleis; subtus flavo-fuscis ocellis quibusdam ad angulum posticarum analem.

♀ mari similis sed colore cæruleo pallidiore et macula ejusdem coloris ad angulum anticarum apicalem.

Hab. BRITISH HONDURAS, Corosal (*Roe*); GUATEMALA, San Gerónimo (*Hague, Champion*), Tocoý (*Champion*); HONDURAS (*Dyson*); NICARAGUA², Chontales (*Belt, Janson*); PANAMA, Volcan de Chiriqui, Bugaba (*Champion*), Calobre (*Arcé*), Lion Hill (*M^r Leannan*).—COLOMBIA; ECUADOR; VENEZUELA.

T. virgilius is by far the commonest species of this genus. We have many specimens from all points in its range given above, these are all fairly constant in their coloration.

11. **Theope cratylus**, sp. nov. (Tab. XLVI. fig. 9.)

T. virgilio affinis sed colore cæruleo anticarum magis extenso et extus magis curvato, et anticis magis acutis.

Hab. PANAMA, David (*Champion*).

This species is described from a single male specimen taken by Mr. Champion. It is undoubtedly closely allied to *T. virgilius*, but the distribution of the blue on the upper surface of the primaries serves to distinguish it.

d'. Wings beneath with a common dark band.

c''. A band at the end of the cell of the primaries.

12. **Theope publius.** (Tab. XLVII. figg. 19, 20.)

Theope publius, Feld. Wien. ent. Mon. v. p. 98¹; Bates, Journ. Linn. Soc. Zool. ix. p. 455².

T. virgilio quoque affinis sed anticis plaga ultracellulari sericea et ultra eam macula indistincta cærulea; subtus fascia communi fusca a costa anticarum ad angulum posticarum analem transeunte.

Hab. PANAMA, Bugaba (*Champion, Trötsch*).—VENEZUELA^{1 2}.

This species was described by Dr. Felder from Venezuelan specimens, which formed part of the late Dr. Kaden's collection, and which are now before us. With these several examples from Chiriqui closely agree, except that they are brighter and in fresher condition. The band at the end of the cell of the primaries distinguishes this species, this is in a similar position, and mimics a character very common among the *Theclæ* of Tropical America. Low forest-region west of Bugaba (*Champion*).

d''. No band at the end of the cell of the primaries.

13. Theope basilea. (Tab. XLVI. figg. 22, 23 ♂, 24, 25 ♀.)

Theope basilea, Bates, Ent. Monthl. Mag. iii. p. 155¹; Journ. Linn. Soc. Zool. ix. p. 455².

T. virgilio similis, sed posticis ad angulum analem multo magis productis; subtus saturatius rufescentioribus, fascia obscura communi ab angulo anticearum apicali ad medium marginis interni posticarum transeunte, macula in medio cellularum, altera ad finem earum et una ad medium posticarum costæ albidis, ocellis binis ad angulum analem.

♀ mari similis sed anticis macula subapicali cærulea.

Hab. NICARAGUA, Chontales (*Janson*); PANAMA^{1,2}, Calobre (*Arcé*), Lion Hill (*M'Leannan*).
—COLOMBIA.

T. basilea is the largest member of the genus. It was described from a female specimen sent us by M'Leannan from the Isthmus of Panama. To these we have added three males, one from each of the localities mentioned above.

c. Wings beneath brown, the base of the primaries yellow.

14. Theope decorata. (Tab. XLVI. figg. 18, 19.)

Theope decorata, Godm. and Salv. P. Z. S. 1878, p. 369¹.

Anticis et posticarum marginibus nigris, macula in margine interno angulum analem prope et ad basin sparsim atomatis, et area posticarum interna cyanea; subtus obscure fuscis, apicibus dilutioribus, dimidio basali costæ anticearum et posticis ad basin ochraceis, fascia arcuata costam partim occupante ad apicem curvata, certa luce purpurecenti-cærulea.

Hab. NICARAGUA, Chontales (*Belt*¹).

T. decorata belongs to a small section of the genus containing *T. janus* and *T. discus* of Bates, the wings of which have a blue blush beneath, and some of them, as in the present case, being yellow at the base of one or both wings. Our description is based upon a single specimen which formed part of Belt's Chontales collection.

C. Subcostal nervure of primaries with two branches only.

ISAPIS.

Isapis, Westwood, Gen. Diurn. Lep. p. 465 (1851).

This genus either consists of one or perhaps two variable species, or when our materials are more complete it may be found capable of further subdivision. It is found throughout Tropical America from Guatemala to Brazil.

The subcostal nervure of the primaries in *I. agyrtus* emits one branch at the end of the cell and one beyond it, the upper radial meets the subcostal some way beyond the end of the cell, the middle discocellular is short but perfect, it meets the subcostal nearly at a right angle, the lower discocellular is curved and atrophied in the middle

and meets the median just beyond the second branch, the costal and median sides of the cell are very nearly equal. The secondaries have a strong basal nervure, the upper discocellular meets the subcostal at an obtuse angle, the lower discocellular is atrophied towards its upper end, and meets the median at an acute angle beyond the second branch; the costal side of the cell is much shorter than the median side.

The front legs of the male have the trochanter inserted beyond the middle of the coxa, the femur $< \frac{3}{4}$ coxa, tibia $<$ coxa, much dilated in the middle, tarsus single-jointed and slender $= \frac{3}{4}$ tibia. Palpi have a short terminal joint $= \frac{1}{4}$ middle joint, which is stout at the base and tapers towards the end. Antennæ forty-one joints, the terminal fifteen forming a moderate club.

The harpagones of the male secondary sexual organs are pointed upwards, the outer and upper edge of the point being setose, in the middle of the outer edge is a narrow lobe, terminating with stray spines directed slightly upwards, arching over the penis is a piece terminating in a blunt point, from the base of the harpagones a long, slightly incurved sharp rod curves upwards into the cavity of the tegumen, the strap from the penis meets the upper edge of this near its base, the penis itself is slightly swollen towards its base, pointed and decurved.

1. *Isapis hera*, sp. nov.

Alis purpurecenti-nigris, anticis fascia obliqua angusta ultra cellulam margines haud attingente aurantia, subtus fere ut supra sed brunnecentioribus, fascia anticarum ad margines producta fulva, altera a cellulæ anticarum medio ad angulum posticarum analem ejusdem coloris eunto.

Hab. GUATEMALA, Sinanja (*Champion*).

This is a near ally to *I. agyrtus*, but it differs in its longer primaries, its upper surface being purplish black instead of brown, the upper band is narrower, and beneath the inner band is also narrower and exactly the same colour as the outer, instead of being yellow. Mr. Champion obtained a single specimen in Guatemala, which seems sufficiently distinct from the Guiana type to be separated. Other forms occur in Venezuela and Colombia which may also be separable, but our materials are hardly sufficient to determine this question. There is a second Guatemala specimen in the British Museum agreeing with ours.

Species incertæ sedis.

Esthemopsis (?) *radiata*, sp. nov. (Tab. XLII. fig. 5.)

♀ alis nigris maculis submarginalibus guttiformibus albis, subtus omnino ut supra, palpis tantum ochraceis: anticarum vena subcostali ramis quatuor nec tribus ut in speciebus generis *Esthemopsis*.

♂ nobis ignotus.

Hab. COSTA RICA, Irazu (*Rogers*).

A single female specimen, sent us from Costa Rica by Mr. Rogers, is the only one we have seen of this peculiar species, which is quite distinct from all known to us. Its position in *Esthemopsis* is doubtful, as the subcostal nervure of the primaries has four branches instead of three, the normal number in the genus.

There appears to be a strong basal nervure to the secondaries.

The palpi in *E. radiata* seem more erect and hairy than in typical species of *Esthemopsis*; but they are red, which is characteristic of the typical species.

Our materials are wholly insufficient to determine the position of this insect satisfactorily.

***Esthemopsis* (?) *unicolor*, sp. nov.** (Tab. XLVII. fig. 6.)

Alis omnino nigris, collare, palpis, et ano aurantio-rufescentibus, antennis nigris vix clavatis.

Hab. GUATEMALA, Panima (*Champion*).

We have but a single specimen of this species, a female, which we thought at one time might be placed temporarily in the genus *Esthemopsis*. But until we have additional examples, and are able to dissect them, its position cannot be satisfactorily ascertained. The chief difference from *Esthemopsis* which we detect at present lies in the neururation of the primaries, one branch of the subcostal being emitted before the end of the cell instead of two.

Mr. Champion captured a single example at Panima in the low hot valley of the river Sinanja, a tributary of the Polochic.

or to the

NORTHERN REGIONAL LIBRARY FACILITY
Bldg. 400, Richmond Field Station
University of California
Richmond, CA 94804-4698

ALL BOOKS MAY BE RECALLED AFTER 7 DAYS
2-month loans may be renewed by calling
(415) 642-6753

1-year loans may be recharged by bringing books
to NRLF

Renewals and recharges may be made 4 days
prior to due date

DUE AS STAMPED BELOW

MAR 9 1991

184145
Biologia Centrali-
Americana.

QH108
B5
v.36
PROTECTED

Biologia

QH108
B5
v.36

PROTECTED
COLLECTION
Apply at
Loan Desk

184145

